Appendix 8–2 (5)

Crop Yield Index – 1971 for BIAD IV

	① Yield of Biad IV	② Yield of Nation	③ Comparative Productivity ①/②	④ Area	⑤ Comparative Productivity ③ x ④
Irrigated Rice	1.1	1.8	0.61	5,303	3,241
Rainfed Rice	1.0	1.2	0.83	2,542	2,118
Upland Rice	0.9	0.9	1.00	55	55
Sugarcane	33.3	29.8	1.12	35	39
Coconut	33	27	1.22	522	637
Corn	1.1	0.8	1.38	2,090	4,264
Fruit Trees	7.2	3.8	1.89	2,253	4,258
Root Crops	2.4	2.6	0.92	1,957	1,800
Total BIAD IV				15,757	16,412

C.Y.I. = ⑤/④ x 100 = 104%

Appendix 8–2 (6)

Crop Yield Index – 1971 for BIAD V

	① Yield of Biad V	② Yield of Nation	③ Comparative Productivity ①/②	④ Area	⑤ Comparative Productivity ③ x ④
Irrigated Rice	0.9	1.8	0.50	7,594	3,797
Rainfed Rice	1.5	1.2	1.25	6,122	7,653
Upland Rice	0.7	0.9	0.78	207	161
Sugarcane	46.1	29.8	1.55	83	129
Coconut	24	27	0.89	348	310
Corn	0.7	0.8	0.88	8,809	7,752
Fruit Trees	2.6	3.8	0.68	1,687	1,147
Root Crops	2.1	2.6	0.81	2,638	2,137
Total BIAD V				27,488	23,087

C.Y.I. = ⑤/④ x 100 = 84%

Appendix 8–3

Supply and Demand of Rice (NEDA)

(Unit: metric tons)

	Consumption			Production			Surplus or Deficit		
	1980	1983	1986	1980	1983	1986	1980	1983	1986
Region VII	271,536	291,975	314,873	141,218	159,399	178,177	-130,318	-132,576	-136,702
Cebu	145,456	156,022	167,601	11,906	12,580	13,290	-133,550	-143,442	-154,311
Bohol	60,222	64,299	68,697	87,736	97,613	107,107	27,514	33,314	38,410
Negros Or.	60,444	65,927	72,512	29,414	36,086	43,511	-31,029	-29,841	-29,000
Siquijor	5,415	5,729	6,064	2,561	2,596	2,622	-2,854	-3,133	-3,441
BIAD I	14,108	14,688	15,303	11,262	12,409	13,645	-2,826	-2,279	-1,657
II	14,134	14,857	15,590	13,165	14,697	15,899	-968	-160	309
III	12,311	13,354	14,497	11,455	13,618	16,578	-856	264	2,081
IV	10,972	11,844	12,798	22,679	25,003	26,904	11,708	13,159	13,927
V	8,698	9,557	10,510	29,154	31,887	34,260	20,456	22,330	23,750

Remarks: Based on per capita consumption of 0.0714 m. ton/year

Appendix 8–4

Supply and Demand of Corn (NEDA)

(Unit: metric tons)

	Consumption			Production			Surplus or Deficit		
	1980	1983	1986	1980	1983	1986	1980	1983	1986
Region VII	555,242	597,036	643,858	94,532	104,095	112,345	460,710	492,941	531,531
Cebu	297,431	319,035	342,713	20,060	25,145	29,027	227,371	293,890	313,686
Bohol	123,143	131,479	140,472	18,006	19,086	20,502	105,137	112,393	119,970
Negros Or.	123,596	134,808	148,273	53,464	56,525	59,139	70,132	78,283	89,134
Siquijor	11,072	11,715	12,399	3,002	3,340	3,677	8,070	8,375	8,722
BIAD I	28,848	30,032	31,291	3,221	3,325	3,627	25,627	26,707	27,664
II	28,900	30,379	31,878	2,640	2,691	2,895	26,260	27,688	28,983
III	25,174	27,306	29,643	3,147	3,226	3,302	22,027	24,080	26,341
IV	22,435	24,219	26,169	2,417	2,642	3,038	20,017	21,577	23,131
V	17,786	19,542	21,491	6,581	7,202	7,640	11,205	12,340	13,851

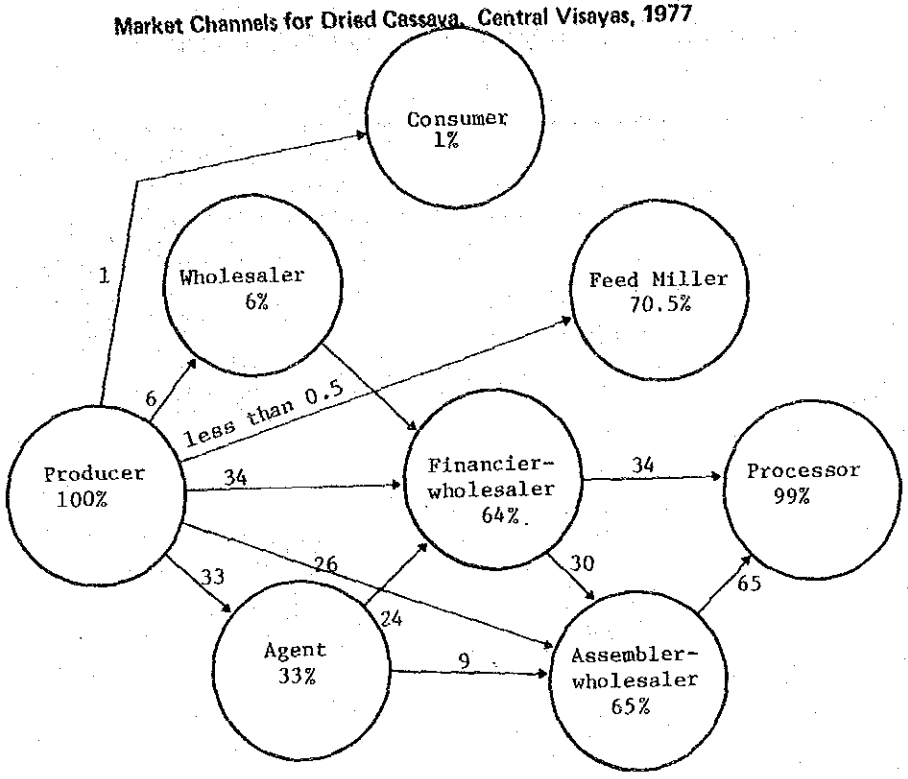
Remarks: Based on per capita consumption of 0.146 m. ton/year

Degrees of Soil Erosion by Soil Types (BS, 1978)

	Area (ha)	Degree of erosion	Erosion Class
1. Ubay clay	79,644	Moderate	2:25-75% of A-horizon removed.
2. Faraon clay	56,536	Severe	3:more than 75% of A-horizon to 25% of B-horizon removed.
3. Bolinao clay	55,871	Severe	3: - do -
4. Batuan-Faraon complex	47,765	Moderate	2:25-75% of A-horizon removed.
5. Annam clay	37,140	Severe	3:more than 75% of A-horizon to 25% of B-horizon removed.
6. Ubay sandy loam	36,142	Moderate	2:25-75% of A-horizon removed.
7. Ubay clay loam	26,272	Moderate	2: - do -
8. Sevilla clay	25,906	Severe	3:more than 75% of A-horizon to 25% of B-horizon removed.
9. Lugo clay	11,713	V. Severe	4:all of A-horizon to 75% of B-horizon removed.
10. Hydrosol	6,373	None	No apparent erosion.
11. Soils undifferentiated	5,833	Excessive	5:all of A & B parts of C-horizon removed.
12. Calape clay loam	5,237	None	No apparent erosion.
13. Butuan clay	2,705	Slight	1:less than 25% of A-horizon removed.
14. Butuan clay loam	2,395	Slight	1: - do -
15. Bantog clay	1,834	None	No apparent erosion.
16. Rough stony land	1,490	Excessive	5:all of A & B parts of C-horizon removed.
17. Candijay clay	1,307	None	No apparent erosion.
18. Inabanga clay	470	Severe	3:more than 75% of A-horizon to 25% of B-horizon removed.
19. Baluarte clay loam	401	None	No apparent erosion.
20. Beach sand	331	None	- do -
21. Mandawe clay loam	138	None	- do -
22. Unsurveyed Area Islets	2,335	None	- do -

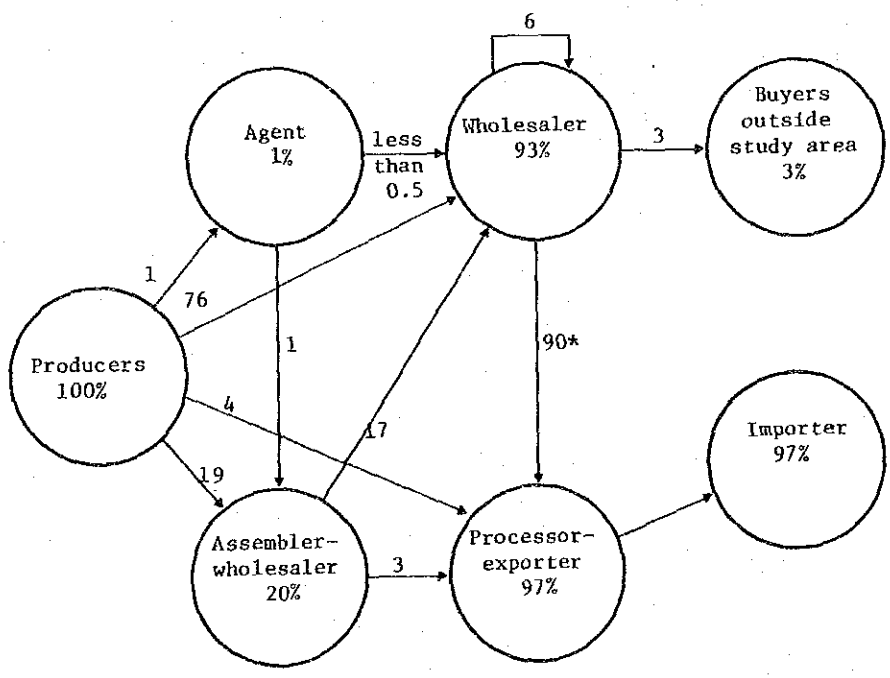
	ha	%		ha	%
Erosion Class 0	17,955	4.4	Erosion Class 4	11,713	2.9
" " 1	5,100	1.3	" " 5	7,323	1.8
" " 2	189,823	46.5	Total	407,837	100.0
" " 3	175,923	43.1			

Market Channels for Dried Cassava, Central Visayas, 1977



Source: "Cassava Socio-Economic and Marketing Study," Part III, DA, 1977

Market Channels for Fresh Coconut Meat and Copra, Central Visayas, 1977



Source: "Coconut Socio-Economic and Marketing Study," Part III, DA, 1977

Note : * Net flow, meaning there was trade both ways.

Approximate Profits of Selected Farm Commodities

	Rice		Corn	Cassava	Coconut
	Irrigated	Rainfed	Shelled Corn/season	Dried Gaplek	Copra/Ha/yr
Yield/Ha	3,800 kg	2,550 kg	1,120 kg	6,000 kg	500 kg
Price/kg	₱1.30	₱1.30	₱0.90	₱0.60	₱3.00
Gross Revenue	₱4,940.00	P3,315.00	₱1,008.00	₱3,600.00	₱1,500.00
Variable Costs:					
1- Land Preparation	₱550.00	₱550.00	₱250.00	₱250.00	
2- Weeding	250.00	250.00	80.00	100.00	
3- Fertilizers	550.00	550.00	255.00	510.00	₱500.00
4- Insecticide	200.00	200.00	20.00	-	
5- Seeds	90.00	90.00	40.00	300.00	
6- Miscellaneous	260.00	260.00	55.00		
Total Expenses	₱1,900.00	₱1,900.00	₱ 700.00	₱1,160.00	₱ 500.00
Approximate Net Profit	₱3,040.00	₱1,415.00	₱ 308.00	₱2,440.00	₱1,000.00

CHAPTER 9
FORESTRY DEVELOPMENT PROGRAMS AND PROJECTS

CHAPTER 9 FORESTRY DEVELOPMENT PROGRAMS AND PROJECTS

9.1 General Background on Forestry in Bohol

Bohol has 309,152 hectares (has) of alienable/disposal land and 102,124 has, of inalienable public land of which 80,275 has, is timberland and 21,849 has, unclassified area. Forest reserves, national parks, military and civil reservations are included under the time timberland, which is under the jurisdiction of the Bureau of Forest Development (BFD).

Forest in Bohol is generally distributed in the higher mountainous areas and hills, and also along the shorelines where mangroves and nipas are grown. Forest in the province is at present not well developed.

The BFD is primarily charged with the function of reforestation and afforestation. In addition, the following specific functions are also included. Forest Occupancy Management, effective forest protection, watershed rehabilitation, timber management and others.

9.2 Analysis of Current Forestry Problems and Trends

The BFD's target areas (in hectares) for the various programs on an annual basis are as follows:

	1980	1981	1982	1983	1984	1985	1986
Reforestation & Afforest.	800	800	800	1,100	1,200	1,300	1,400
Forest Protection	102,124	"	"	"	"	"	"
Kaingin Management	727	1,047	723	4,345	1,584	-	-

Forest growth in Bohol is not so abundant. This may be due to the following factors:

a) problem soils,
b) soil erosion,
c) mismanagement, etc.

The predominance of calcareous soil in Bohol limits the reforestation and afforestation programs since this type of soil cannot supply the seedlings with proper nutrition.

Very serious soil erosion takes place because of the topography of the forests, the characteristics of base rocks, and the existing bare spots within the forests. In bare forests where no cultivation is made, cogon and brushwoods are abundant. Cogon is considered the biggest enemy in the natural ecosystem for the reforestation programs.

Heavy soil erosion taking place in the forests is sometimes caused by the shifting cultivation of "Kaingin." The most serious soil erosions occur during the first seeding time after the forest have been burnt out because the soil is bare at this time. Forest protection will be a very important tool for checking any illegal opening of forest land

by the "kaingineros." A monitoring system should be established with provision of motor vehicles.

The total land destruction due to kaingin reached about 1,800 has. in Region 7 and resulted in a denuded area of 530 has. in Bohol, according to the BFD. It is important to note that once the soil is eroded it never regains the original level of forestry and is overgrown with cogon.

Aside from denudation, kaingin and forest fires, the socio-economic aspects of the program implementation continue to be a more serious problem than the technical aspect which confront the program administrator in all levels. There is also another type of socio-economic problem in forestry involving the case of wealthy forest holders who wish to be free from forestry tax by making fires so that they could declare their forests as kaingin areas. Such complicated cases have happened many times.

9.3 Forestry Development Potentials

Denudation resulted not only from kaingineros but also from common farmers who wish to extend their farmland. As a result, the forest area will decrease in hectarage unless the BFD tries to increase the forest by reforestation. Even then, it seems that Bohol's forests will gradually decrease in hectarage due to the many reasons mentioned above, despite the tremendous efforts for increasing forest hectarage which will be made.

Accordingly, the monitoring system for patrolling inside forest areas is urgently requested for keeping and controlling forests from damage. At the same time, information concerning soil erosion caused by careless denudation should be given to farmers and kaingineros in order to have them fully realize the consequences of erosion damages.

With the tendency of decreasing area, profitable timber should be kept in good condition and new trees be replanted when old ones are cut down. In this case, fertilizer application needs to be made to insure quick growth of new trees. Another idea may be to select a suitable quick growing type of trees like ipil-ipil and to plant them around the trees marked for cutting. It is recommended that the selection trials of quick growing trees be conducted in at least 2 sites in Bohol, from which one or two substitutes for ipio-ipil can be hopefully identified.

All steps should be taken to preserve the watershed forests in Bohol. Otherwise, the Wahig-Pamacsalan Water Reservoir and other reservoirs and rivers will be dried up in a short period of time.

9.4 Objectives and Targets for Forestry

Although the BFD is charged with the protection of both lowland and upland timberland and the conservation and wise exploitation of timber and other forest products, forest hectarage will decrease to a certain

extent year by year due to denudation but mostly due to the expected population pressure in the future. This commonly happens in every province and country.

In the light of the above, the objectives of forest development in Bohol are identified as follows:

- Reforestation and afforestation
- Watershed rehabilitation
- Forest protection
- Kaingin management including re-settlement to flat lands
- Control of agro-forest cultivation with restrictions on the area per family.
- Selection of quick growing trees.

9.5 Proposed Forestry Development Project

The proposed project of forestry development in Bohol is "Watershed Rehabilitation in all River Catchment Areas in Bohol". It seems that the protection of watershed areas is a most urgent task to be accomplished. The proposed project will survey the watershed areas over all river catchment areas and take corresponding rehabilitation measures. Based upon the feasibility study, the construction works on bench terracing, check dams, impounding water reservoirs, ripraps for river embankment, replanting trees on marginal area, etc., will be implemented. The proposed project will require three consultants for each particular field for about 6 months; 3 months fieldwork and another 3 months for report writing.

9.6 Project Implementation Plan

The feasibility study on the proposed project, "Watershed Rehabilitation in all River Catchment Area," should be conducted in the latter part of 1980. Upon completion of the study, the Watershed Rehabilitation Project must be implemented in 1981.

9.7 High Impact Project

Feasibility Study of Watershed Rehabilitation in all River Cachment Areas in Bohol

9.7.1 Objectives

Watersheds must be urgently protected by all means in order to conserve the limited water resources in Bohol. Watershed rehabilitation includes the following activities:

(1) Survey of the watershed and catchment areas

(2) Bench terracing in identified critical watershed

(3) Construction of check dams for water impounding, etc.

(4) Riprap for river embankments

(5) Planting quick growing trees, and others

In Bohol, watershed and catchment areas of most rivers need such rehabilitation measures in order to maintain the water resources.

9.7.2 Project Description

All watershed and catchment areas need to be studied regarding their present condition and required rehabilitation measures. The feasibility study should clarify the following:

(1) Forest protection measures

(2) Rehabilitation measures including engineering works

(3) Making boundaries and limitations on kaingin activities

The study needs about 3 months fieldwork and another 3 months for report writing. The study team will be composed of a) Watershed rehabilitation expert, b) civil engineer and c) agro-soil expert. The study should be conducted in close cooperation with the BFD in Bohol.

9.7.3 Cost Estimate

The breakdown of the cost is indicated below:

Three experts for 6 months at	₱18,250 x 3 x 6	₱328,500
Travel costs at	₱ 5,500 x 3	₱ 15,000
Per Diem at	₱ 700 x 3 x 180	₱378,000
Report writing		₱ 50,000
Miscellaneous		₱ 6,000
Overhead cost		₱116,700
Total		₱894,200 (US$122,500)

CHAPTER 10
FISHERY INDUSTRY DEVELOPMENT PROGRAMS AND PROJECTS

CHAPTER 10 FISHERY INDUSTRY DEVELOPMENT PROGRAMS AND PROJECTS

10.1 General Background of Fishery in Bohol

Bohol is richly endowed with marine and fishpond fishery resources. However, the existing resources have not yet been fully exploited for the purposes of development of modern fishery industry. The retarded development of fishery industry in Bohol is caused by the insufficient financial resources available to investment to establish modern fishery industry, lack of improvement in the necessary infrastructure, etc.

The fishery industry is considered as one of the major economic sectors of Bohol which should be greatly stimulated in order to bring about higher income and more employment opportunities to Bohol. It is imperative that a long term development plan should be drawn up for the Bohol fishery industry by taking into consideration: 1) fishery resources availability in Bohol, 2) technological innovation of fishing and processing methods, 3) the need for planning and management skill of marketing fishery products inside and outside Bohol, and 4) the development of export-oriented fishery industry as a means of earning foreign exchange.

While it is to be recognized that long term sectoral development planning is needed for rational allocation of the fishery resources in Bohol, an urgent requirement for the Bohol fishery is to identify and formulate a set of development projects which could be implemented within a relatively short time span and perform "propulsive and catalystic" functions for the development of fishery industry in Bohol.

10.2 Description of Current Fishery Problems and Trends

Bohol island is endowed with good fishing grounds: vast shallows which are good for habitation and regeneration of various species along the coasts of east and north, and the existence of passages for migratory pelagic species not far away from the west and south coasts. Furthermore, almost the entire coast of Bohol is surrounded with swamps and estuaries ideal for fishponds. The weather is also suited for fishery. There has been no record of typhoons, and only one experience of a disastrous flood. The annual rainfall is moderate, ranging from 1,500mm to 2,000mm depending on topographical and physiographical conditions (see Appendix 10-1). Although the fishing industries of Bohol must have been favored by all the naturally good conditions mentioned above. Since early times, the fisheries of Bohol have not been fully developed. Many of its fishermen are still engaged in sustenance fishery.

Fisheries Statistics of the Philippines indicates that Bohol produced the following tonnages of fish in 1976:

	Tonnage	%
Commercial Fisheries	1,713	5.8
Pond Fisheries	1,048	3.5
Municipal Fisheries	27,009	90.7
Total Landings	29,770	100.0

If it were assumed that all of the above quantity of total landings were consumed by the total population of Bohol, Bohol's fish consumption per capita would meet the fish requirement established by the Food and Nutrition Research Center. However, it is hardly realistic to consider that the entire volume was consumed in Bohol. A considerable volume of the catches was transported outside of Bohol to profitable markets such as Metro Cebu or Manila.

It is disheartening to note that Bohol is conducting a sort of hunger-export as far as their fisheries are concerned, i.e., while the Boholanos suffer from low level of protein intakes, the precious source of protein is being exported. Therefore, it is imperative that the fishing industry of Bohol must be developed to fully utilizing marine and inland fishing resources existing in Bohol.

10.3 Assessment of Development Potentials of Fishing Industry in Bohol

10.3.1 Fishing Grounds

It is judged that Bohol Island is endowed with good fishing grounds. However, it should be noted that the size of each fishing ground is limited within the area which can be accessed by the present level of fishing technology and scale of business enterprise. Consequently, the fisheries of Bohol should not aim at extending the area of activities beyond the straits and sea area surrounded by large neighboring islands, but should be limited to the coastal fisheries and the aqua-culture fisheries. The resources of coastal waters and potentialities of the aqua-culture in Bohol are not only sufficient to meet the required consumption of the Boholanos, but also capable of exporting to the markets outside Bohol.

10.3.2 Market

The Fisheries Statistics of the Philippines in 1976 classifies the species of marine products into nearly one hundred ichthyographical items. These should be re-classified into the types of fish which may have commercial value for selected consumer markets. Cebu and Manila are good markets for milkfish. Squid and cuttlefish are very much preferred by European markets if the fish-size is smaller than about 45 grams each, and shrimps/prawns are in great demand in Japanese and U.S.A. markets. It might come as a surprise to Bohol fishermen that Japan imported sea-urchins, more than 2,300 tons (about US$25 million) in the year 1978, from various countries including the Philippines. Some varieties of marine products available in Bohol could be processed under modern techniques into the merchandise of higher commercial value, and strategies such as this

for the fish processing industry will be discussed later. However, it is to be emphasized that marketing is an integral part of the fishing industry in order for the industry to be successful. It is our judgment that many varieties of marine products of Bohol have good markets not only in the Republic of the Philippines but also in the major fish consuming countries.

10.3.3 Fishing Port Infrastructure

In modern fisheries, a number of facilities are required on shore in order to operate the industry successfully. Without appropriate infrastructure, the home-based industry cannot compete with others of neighboring coasts which are more properly equipped. Bohol has no particular fishing port where fuel, water and repairing is provided. Such a fishing port should provide facilities for safe harboring and discharging catches, as well as, recreational opportunity for fishermen, information about current fish market and fishing trends and normal replenishment and repair of fishing vessels and equipment. When an export-oriented fishing industry is developed in a tropical area, a modern fishing port must be established with adequate facilities for ice-making and refrigeration as well as processing. In addition, special type of facilities are needed to meet the requirements of carrier-vessels which transport the export merchandise. Normally, the installation of such a modern fishing port is the responsibility of government as an important component of its public investment program.

10.3.4 Technical Training

Since over 80% of the Boholanos are literate and can communicate in English, they have an advantage which will allow a quicker transfer of technologies of the industry. Bohol has a Merchant-Marine Training School in Tagbilaran, the Aquaculture Demonstration and Training Station (under the assistance of UNDP & FAO) in Calape and the Bohol School of Fisheries in Candijay which provide higher education and training for the fishing industry. The training given by these institutions is considered sufficient to educate personnel required for the development of a modern fishing industry in Bohol. Although Bohol might be regarded as a depressed and under-developed province from the point of view of economic and industrial development, when it comes to its capability of producing technical personnel, the province is in a relatively good condition to produce skilled manpower needed for the development of its fishing industry.

10.4 Major Problems of Fishing Industry in Bohol

10.4.1 Lack of Infrastructure

The major fishery producer in Bohol is the municipal fisheries which recorded yield of 27,009m/t (90.7%) out of the total output of Bohol Fisheries, 29,770m/t in 1976. The poor yield of the commercial fisheries of 1,713m/t (5.8%) is due to a poorly developed infrastructure. Bohol has almost none of the infrastructure essential for the

commercial fisheries except for a few piers originally provided for the benefit of merchant marine of coastal vessels. It must be noted that none of these piers, even the biggest of them at Tagbilaran, has the facility to provide freshwater fuel or oil.

The Total ice production of Bohol is estimated to be 10 tons a day in Tagbilaran, out of which 1/3 goes to the non-fishery sector. A very small ice plant exists in Talibon whose production capacity is not more than 600 kg a day. Both plants are privately owned and operated. It is reported that the ice plant in Tagbilaran is planning to expand its production capacity to 25 tons and that the machinery installation work is under way. There is a modern construction coldstore in Tubigon, but it is without an ice-making plant, and the entire installation has been out of operation in the past several years. With the proper support of a fishery infrastructure, the small volume of commercial fisheries can be improved.

10.4.2 Competition with Cebu

The shallow water area laying along the northern coast of Bohol is an excellent fishing ground for both demersal as well as migratory fishes and other marine-products. The coast has flows of river-water, nutritious enough to allow reasonable regeneration of marine species. Because this coastal belt of shallow water is richer in marine resources than the east coast of Cebu Island, and because motorization of fishing vessels is progressing rapidly in the neighboring islands, these resources have not been monopolized by Bohol fishermen. It is believed that quite a large number of Bohol-registered fishing vessels are doing their business on the Cebu coast, mainly at Mandaue, to seek better market prices and cheaper operating costs. As a result, there is less return for Bohol. In order for Bohol to develop its fishing industry on a large scale, it will have to expand beyond the shallow waters where it is now consentrated.

10.4.3 Lack of Demand in Local Market

Despite the famous belt of tuna-fish off the waters of the south-western coast of Bohol, the recorded landing of this migratory species has been small in the past. Records for 1976 also show that there has been no catch of skip-jack, and only 485 m/t of the yellow-fin and big-eye have been caught. This can be attributed to the fact that there has been less demand in the local market and almost no demand in the Cebu market.[1/] It is believed that people of the Visayas do not like this type of species unless the fish is oiled and packed in a tin. As stated earlier, there is insufficient ice production even in Cebu City and no refrigeration facilities for transporting the fish to distant canning factories which can process tuna fish. Consequently, Bohol fishermen are less motivated to try to catch tuna fish on the sea. It should be understood that these fish have high market value outside the Philippines. For example, canning factories of the West Coast in the U.S.A. quoted US$960 per short ton ex-vessel prices for frozen skip-jack and US$1,250 per short ton for frozen yellow-fin and big-eye in May of 1979.

10.4.4 Insufficient Development of Fishing Method

There is an abundance of excellent "live-bait" in Bohol such as anchovy, sardines and other tiny fish which are essential and vital for the operation of Pole and Line Fishing. The "live-bait" method of fishing is commonly used by many nations, such as Japan, U.S.A., Indonesia and Southern Pacific countries, but this popular art of fishing has not yet been utilized by the fishermen of Region VII. On the other hand, for the Philippines as a whole, the Fishery Statistics of 1976 show a record export of preserved tuna (Katsuo Bushi) of 5,000kg (₱83,813). This could be regarded as a sign of the beginning of the proper use of the marine fisheries potentiality in the country. It is also reported that the canning factories on the West Coast U.S.A., have a large demand to import frozen skip-jack tuna fish from the Philippines, estimated to exceed 50,000 tons in 1978, although the origin of such exports were not Bohol nor Region VII.[2/]

10.5 Identification of Development Facilities for the Fishery Industry in Bohol

10.5.1 Shrimp/Prawn

The waters along the east coast of Bohol are rich in shrimp/prawn resources. However, it has become known to us during the course of field research that no fishermen go after shrimps/prawns in that area. Shrimps/prawns are only periodically harvested from fish-ponds and occasionally as by-products which have almost no means of being marketed except for big prawns in good condition. The east coast of Bohol is still practically unexploited firstly because of the long distance from the market and secondly because of the lack of ice and refrigeration facilities.

10.5.2 Milkfish

In the Census of Fisheries of 1971, records of gathered fishery products include fry of milkfish, but no shrimp fry in Bohol. The actual gathering sites were visited and gathering operation was observed.[3/] The operation sites are limited on sand beaches scattered on the coast between the Municipalities of Dimiao and up to the east end of Anda. It was claimed by the leader of the fishermen at Guindulman (the center of the gathering operation) that annual average yields are about 16 million pieces of milkfish fry, and 7 to 8 million pieces of prawn larva (Penaeus Monodon, Fabricius). Assuming a high mortality rate of about 50%, the surviving number are equivalent to milkfish of about 2,600 tons of commercial size and of prawns (head-on) about 245 tons of commercial size. Together with possible shrimp/prawn fishing grounds off the east coast of the island, these frys are judged to be the largest potential resource of Bohol's fishing industries yet to be exploited.

10.5.3 Favorable Natural Environment

As mentioned earlier, the annual average rainfall over Bohol is reportedly between 2,500mm and 3,500mm. The eastern mountain region is considered the wettest and the western and north-east region is reportedly rather dry. The rainfall is never concentrated in a particular month or season. In other words, there is no possibility of flooding of the fishponds and there is a possibility of harvesting more than twice a year. The tidal current speed around Bohol is also very moderate since the speed never exceeds more than two knots. The tidal difference at Cogtong Bay, East Bohol, is estimated at 1.9 feet. The precise climatic table of Bohol was not obtained, but observation records at Cebu are attached in Appendix 10-1 for reference.[4/]

10.5.4 Seaweeds and Sea-Urchin

Other commercial marine resources to be noted are seaweeds that are edible and preferred by the Japanese as served in Cebu Japanese restaurants, a family of agar-agar which is already being exported in sizeable quantities and the abundance of sea-urchin which is preferred by the local people and it is sold in the local market, salt-cured and bottled. These items should be further researched for export possibilities. The import of selected marine-products by Japan is indicated in Appendix 10-2 for reference.

10.5.5 Fish Ponds

Although milkfish (Chanos chanos, Forskal) grow to 100cm in length in the open sea or estuary, the fish is traditionally regarded as being "commercial-size" when they are about 25cm to 32cm in length. The annual frequency of harvesting depends on the nature of monsoon rains. When the monsoon rains come in April and the dry season starts in November in Northern Luzon, the harvesting is made there twice a year. However, places like Bohol, whose rainfall is more or less evenly spread throughout the year, harvesting three times a year is possible. As a rule of thumb, the experienced fishpond operator will dry up the pond after harvesting and apply insecticide and fertilizers. All these observations are stated in The Reports of Dr. G. Ohshima, Professor of Kansai Gakuin University and confirmed through the field research work of this report.

In general, fishponds in the tropical area are also known for good harvest grounds of shrimps, particularly for those of small sizes of Parapenaeopsis and Metapenenaeus families. These shrimps come into the ponds (pens) through the screen of water-inlets where they do not encounter their natural predators. Since milkfish are known as "vegetarian" while shrimps are "carnivores" feeding on plankton and small insects, they could live together in a pond. As the shrimp's life lasts about one year during which time they grow into their maximum length, when the milkfish ponds are dried for the next crop, there would always be a large quantity of premature and under graded small size shrimps left in the ponds. Small shirmps grown in

fishponds are left untouched in Bohol. However, if there were cold-storage and refrigeration facilities, these shrimps (weighing about 45gm and above) could be processed into "headless and shell-on" frozen shrimps. The smaller shrimps could be processed into frozen "peeled" and "IQF" shrimps who are highly valued in overseas markets. This trade has become already common among Indonesian and Malaysian fishpond operators and been considered as one of their vital income sources.

10.5.6 Need for Research on Marine Resources

Fish barriers, fish-stakes and other fish-traps have been the traditional fishing arts of tropical Asians for generations. These fish-traps are often seen in the coastal off-shore areas of Bohol and provide steady sustenance and small-scale fishery business. This type of fishing method is to be regarded as the most ecologically peaceful means of fishing for it leaves little possibility of over-fishing. These methods are continuously used throughout the year in Bohol. The yield of fish caught by this method vary in accordance with the cycle of nature. There was no way of acquiring a detailed information on productivity of the barrier method during the course of field research, but it is believed that barriers along the east coast of Bohol have recorded shrimp catch of 200kg to 600kg a day per unit for the period of October to December. About 30 units of the barriers are reportedly operating in BAIDS III and IV, including those on the southern coast of Lapinig Island. It is quite possible (according to the old fishermens' criterion) to chart the shrimp/prawn fishing grounds. Further technical study is also recommended for verification of marine resources of Bohol.

10.6 Selection of Fishing Industry Development Area

10.6.1 Concentration on Coastal Fisheries and Aqua-culture

In consideration of the geographical situation, the limited size of the market for fish and limited manpower, the activity in the production of Bohol fisheries should concentrate on coastal fisheries and aqua-culture for the short term. Plans for ocean-going fisheries should be postponed for a later stage and immediate investments should be made in the infrastructures most needed for the quick development of off-shore fishing and aqua-culture.

10.6.2 Avoidance of Over-Fishing in the Northern Coastal Area

Today, the most highly exploited fishing grounds of Bohol are the shallow shelves off waters along the northern coast. These shelves are hedged in by the Danajon Bank and North-West Bank where good commercial fishes, such as Perches, Breams, Snappers and demersal shrimps are found.[5] It is generally understood that these fishing grounds are a very important supply resource for Cebu rather than for Bohol. This is because of the closer distance between the two islands and because Cebu can also afford to offer higher market

prices than Bohol's coastal Municipalities, including Tagbilaran. The demand of Cebu has been and is still so strong that there are good reasons to believe that Bohol's traditional fishing grounds are being over-fished by its municipality fisheries. Some areas are reportedly to have already reached to the level of maximum sustainable yield and the catches have started to decline. If such is the case, any effort to increase the catches from these waters should be subject to careful scrutiny.

10.6.3 Tagbilaran not Suited for Fishing Industry Development

Tagbilaran is the biggest market for fish in the Province. Nevertheless, the conditions of Tagbilaran are not suited for the location of the core development area of the fishing industry. Firstly, Tagbilaran today cannot produce the 50 tons a day which is needed to support infrastructure of a modern fishing industry. Peeled shrimp processing alone requires about 3 tons of good potable water for producing 1 ton of the shrimp of export quality. Secondly, the Tagbilaran Port will need further development for accommodating the requirements of a fishing industry. Thirdly, Tagbilaran is quite far away from the center of fishing grounds and fishponds of the eastern coast of Bohol Island.

10.6.4 Southern Coast Area

The terrain of the south coast of Bohol is by nature not very good since there is almost no natural shelter against the south-western wind which is considered the strongest wind in Bohol. From Baclayon to Anda, all ports are not protected except Jagna. Even Jagna is insufficiently sheltered by Cantagay point. The Loay river mouth may be judged useful if certain improvement of installations will be made for pelagic fisheries in the future. Nevertheless, this area is still far from the major fishing grounds and the center of fishponds.

10.6.5 Development Potentiality of Cogtong Bay Area

The infrastructure of the east coast of Bohol is extremely underdeveloped. Roads run only far inside the hinterlands and there is no sizeable port, only landing beaches. However, the coast is surrounded with the most well-designed fishponds and mangrove swamps waiting to be made into prosperous aqua-culture farming grounds. Off the coast, there is quite a wide area of shallow waters, good for trawler fishing for the purpose of catching shrimps and prawns. Apart from fisheries, the region is known for cattle farming from which numerous livestocks are shipped to neighboring islands, mostly to Cebu. It is a generally held opinion that one fishing port center is not sufficient for the entire Bohol Province. However, if an urgent and immediate installation is required for fishery industry, one port is recommended to be built along the coast of Cogtong Bay, subject to a detailed examination of the nature of soil and topographical conditions. Undoubtedly, Cogtong

Bay has the biggest fishpond and a vast unexploited swamp area for further development and future expansion.[6] Furthermore, Cogtong Bay is surrounded with shallow shelves of water which are ideal for fishing grounds for trawlers and is full of resources including shrimps and prawns which are the most promising export oriented species of the country. Since the terrains of the area are well wooded, receives a good amount of rainfall evenly scattered the whole year round, and flows of land-waters are divided by three rivers, the risk of floods over fishponds is minimal. All these natural conditions will have excellent effects on regeneration of marine resources. Except for the roads and the Bohol School of Fisheries in Candijay, this area lacks infrastructure indispensable to the fishing ports. Infrastructure investment by the public sector should be a priority consideration for fishery development.

10.7 Development Objectives

On the basis of the evaluation made in previous sections regarding fishery resources existing in Bohol, the following objectives are set forth for the development of fishing industry.

10.7.1 Short-Term Objectives (1980-1983)

Through the proposed "High Impact Projects", fishermen and pond operators of Bohol will be encouraged to make the best use of ice, coldstorage and freezers for preservation of catches which will facilitate extending their fishing grounds, operation period and exploiting additional markets to realize the following objectives:

- Raising the level of production of the fishing industry
- Increase in income to fishermen and pond-operators
- Utilizing more of both natural and human resources which increase opportunities for additional employment
- Up-grading living standards of all concerned with fishing industries of Bohol
- Commencing direct earning of foreign exchange
- Increase of enough catches to feed entire population of Bohol at reasonable and accessable prices.

10.7.2 Medium-Term Objectives (1983-1985)

With the success in the Short Term, the fisheries of Bohol will be able to accumulate funds and achieve a good reputation for attracting investment for further expansion of fishing industries. Thus, promotion of following objectives will become feasible for the Medium Term:

- Further introduction of modern fishing and processing arts, particularly, with new items for resources believed to sufficiently exist in Bohol

- Improvement of infrastructures with other BIADS
- Establishment of modern fishing industries on more sound and competitive footing.

10.7.3 Long-Term Objectives (1985-2000)

- Commencement of Commercial Fisheries, particularly with pelagic fisheries for skipjack and other tuna fishes by modern fishing vessels and shore-installations.
- Commencement of a large scale export oriented fishing industries including cannery for tuna and crustaceans.

The development objectives above should be, however, interpreted as general goals to which fishery industry in Bohol should be directed in the future. It must be also noted that due to lack of a comprehensive survey report concerning fishing industry in Bohol, planning target variables cannot be made for each of the objectives.

10.8 Development Strategies of Fishing Industry in Bohol

10.8.1 Diversification of Domestic Market and Establishment of Export-Oriented Business

It must be recognized that the fishing industry of Bohol is in need of major economic stimulation such as diversification of domestic markets and initiation of export oriented business. Milkfish is in great demand in the Metro Manila markets. Prawns and shrimps, even small shrimps, are strongly demanded by the Japanese market at very attractive prices. Furthermore, even squids, cuttlefish, octopus and sea-urchins, all of which are available on the coasts of Bohol, also have strong overseas demands. It is therefore strongly recommended that the strategy of Bohol fishery development in her first stage should focus on: 1) diversification of market, viz., for Metro Manila and for Cebu and, 2) promotion of export oriented activities.

10.8.2 Effective Linkage with Other Sectors

The fishery industry could have significant linkages with other sectors, particularly with agriculture. Fishery industry could provide manures, animal feeds and cheap protein to a large segment of Bohol's population. The husks from peeled shrimps and prawns are known to be a good fertilizer for coconut plantations as well as a good calcium feed for poultry. Fish cut-cleaning refuses are good feeds for hogs. Fowl droppings could also be used as fertilizers for fishponds.

10.8.3 Establishment of Fish Processing Industry

Despite the availability of modern fish processing technology, preserving the fish's meat without using preservatives is still considered practical. The method often used is packing which mixes cattle

meat and materials which are available at much cheaper prices than canned goods. Traditionally, canning has been a major component of fishery industry, but for Bohol, where fish and meat are in abundance, the possibility of establishing "fish and meat mixture" film-packing plant should be sincerely considered.

10.8.4 Development of Fish Processing Complex

It is strongly recommended that a fish processing complex should be established in the Cogtong Bay area and the complex should consist of 1) a fishing port and 2) fish processing plants. The proposed activities of the complex should be;

- To serve as a collection depot of milkfishes, shrimps and prawns caught from neighboring fishponds and east coastal area of Bohol
- To carry out processing and peeling operations
- To freeze them in coldstorage and ship them to Metro Cebu or Manila
- To manufacture fish sausages

10.9 Formulation of Development Program of Fishing Industry in Bohol

In accordance with the policy guidelines established for the Bohol Integrated Area Development plan, a primary focus was placed upon identification of "high impact projects" for the development program of fishing industry in Bohol. As with other sectoral development plans, the high impact project were identified according to the following criteria:

- Income generation
- Employment absorption
- Backward and forward linkage effects
- Population and/or area to be benefited
- Low input requirements, e.g., energy, finance,
- High speed in generating effects
- Full utilization of resources of Bohol
- Long lasting effects
- Demonstration effects
- Technological innovation and diffusion
- Agglomeration effects
- Propulsive, catalystic functions

In keeping with these principles of project identification, a development program of "Cogtong Bay Fishing Industry Complex" was formulated.

10.9.1 Description of Cogtong Bay Fishery Industry Complex (CBFIC) Development Program

It is proposed that the Cogtong Bay Fishing Industry Complex (CBFIC) development program should be composed of the following project components:

- Cogtong Bay Fish Processing Plants Complex Development Project
- Cogtong Bay Fishing Port Development Project

1. Goals of CBFIC Development Program

The goals of the CBFIC development program are spelled out as follows:

- To activate fishing industry in the coastal area of BIADs III and IV.
- To establish export-oriented fish processing industry which uses shrimp and prawn as its main materials.
- To utilize manpower available in Cogtong Bay area.

2. Major Functions of CBFIC Development Program

1) Cogtong Bay Fish Processing Plants (Complex) Development Project

- To supply ice to the fishermen in the east coast of Bohol enabling them to prolong their operations at sea
- To act as a distribution center for the catch of trawlers
- To freeze shrimps and prawns caught from the neighboring fishponds and off-shore area of Eastern Bohol to be exported outside of Bohol
- To manufacture the film packery of "fish and meat mixture (fish sausages)"
- To freeze milkfish and other catches to be shipped to Cebu, Cagayan de Oro, Manila
- To develop this Complex into one of the major centers of an export-oriented fish processing industry in Bohol

2) Cogtong Bay Fishing Port Development Project

- To act as the major fishing port in the eastern coastal area of Bohol
- To harbor fishing vessels of municipal fisheries and trawlers
- To have facilities to repair vessels including a "slipway"
- To enable REFEER (Refrigerated cargo-vessel) to stay alongside the wharf/pier

3. Cost Estimates & Economics

In order to carry out the fish processing operations mentioned above, three plants are required which constitute the Fish Processing Complex: 1) Ice making and freezing plant, 2) film-packery plant, and 3) shrimp peeling plant.

The construction and purchase costs of main physical facilities and equipment for both projects are estimated as follows:

Unit: ₱1,000

Cogtong Bay Fish Processing Plants Development Project	₱25,424
Cogtong Bay Fishing Port Development Project	₱17,880
Total	₱43,304

Some estimates of the cost breakdown of the major capital outlays of the fish processing plants are given in Appendix 10-5 and the operational program and economics of the fishery processing complex are given in detail in Appendix 10-3.

4. Conditions and Requirements

1) Timing of Construction

In normal fishing industry development, the construction of a fishing port comes first. However, in terms of realizing an immediate and effective impact needed for the industry, the long period needing for constructing the fishing port is counter productive. Therefore, the construction and installation of a Refrigeration Plant and Ice-Making Plant should proceed prior to port construction.

2) Location Requirements

Under normal conditions, the site of the Ice-Making Plant and Refrigeration Installation for Fisheries should be located within the premises of the fishing port or its vicinity. In the case of the CBFIC development program, the site of the fishing port will not be finalized until the date of submission of this report. However, it would be ideal that the site of the fishing port be along the Cogtong Bay area or within its vicinity, because the Eastern Coast of Bohol is judged to be the most resource rich and yet unexploited place. Cogtong Bay is also situated in the most favorable geographical conditions.

Considering that the desired objectives of the Program are 1) diversification of market for pond fishery and 2) promotion of export oriented fisheries, the site of the fish processing plants should be located within the territory of Candijay where the following conditions are provided:

(a) Availability of raw materials to be processed, such as milkfish, shrimps and prawns and meat/ingredient fish for ice-chilling, frozen processing and film-packing.

(b) Availability of good quality water at cheap cost.

(c) Availability of a multitude of good quality manual laborers (preferably female). Obviously, a remote site would be inconvenient for commuting to.

(d) Although the coastal area is full of fishponds and unexploited swamps of mangroves, the coastal region east of Bohol, i.e., the Municipality areas along the coast of Candaroy Bay and Lapinig Island are not connected with land transport system because of the absence of roads. Nonetheless, these fishponds and their fish-barriers are potential supply sources of raw materials and Candijay and Cogtong are the only possible landing sites for their raw materials to be transported by boats.

5. Operational Planning

1) Temporary Transportation

Until the completion of the fishing port with wharf/pier for the REFEER, export shipments shall be conducted through Jagna or Tapal (east of Ubay) where a wharf/pier is available. The distance from Candijay to Jagna is 27km while Candijay to Tapal is about 32km via Ubay. Three refrigerated trucks are necessary for shuttling between export-loading ports (Jagna or Tapal) and the site of the complex, and for transporting ice for distribution.

2) Film-Packery Technology

Film-packery using a "fish and meat mixture" of preserving food was originated in Japanese Foods Industry. The idea was developed to meet the strong demand from the interior where fresh fish and canned items were not readily available. At the initial stage, whale-meat and tuna fish were used as the main ingredients, seasoned with salt/spices according to the consumer's taste. Today tuna and whale have become scarce in Japan; hence, the main ingredients have become codfish and meats. It is judged that this technology can be transferred to Bohol where beef, buffalo meat and flying fish are quite cheap and available throughout the year. These items can compete well and substitute for imported canned fish and meat because the cost of the packing material, film, is far cheaper than canned material. The ratio of meat and fish, seasoning and spices are subject to consumer preference.

3) Quality Control

All export-oriented fish-processed merchandise are subject to quality standards and inspection to a level acceptable to the authorities concerned at the place of destination. Therefore, the quality-control in Bohol must follow overseas standards as strictly as possible. Necessary research must be conducted to modify the recipe and formula of the merchandise to adjust to the demands and trends of each market. All such works should be assigned to the Laboratory of the Fish Processing Plant.

4) Scale of Production

The planned freezing capacity is for a daily production of about 3 tons. Expansion is easy since additional freezers can be installed without difficulty. However, suppliers are limited because the area of fishing ground is limited. It is recommended therefore, that the Authorities concerned will limit the issuance of fishing permits to less than 15 trawlers (maximum tonnage each about 15 gt.) or an average daily catch of shrimps/prawns to 3 tons from the fishing grounds off the east coast of Bohol. However, no restriction over the productivity of fishpond is required.

At the initial stage of production at the Fish Processing Complex, the following output is targeted:

Fish Processing Complex Production Targets

Type of Output	Daily Output (Tons)	Operating Days/yr	Annual Production (Tons)
Ice Making	15	300	4,500
Frozen Prawns	3	200	600
Film-Packing	500	100	50,000

A detailed operation program and its economics is attached as Appendix 10-3 for reference.

6. Required Physical Facilities and Equipment

1) Fishing Port

The suggested capabilities of the port are: harboring fishing vessels of Municipal Fisheries and trawlers not exceeding 30 gt., off-loading their catches, refueling, fetching potable water and other supplies and having facilities for repairing vessels including a slipway. It would be ideal for the fishing port to be able to allow a REFEER (refrigerated cargo-vessel) to stay alongside the wharf/pier where the draft of water depth is deeper than 4.5m at the mean low-tide. This wharf/pier could service merchant marine vessels when the need arises.

2) Fish Processing Plants

Refrigeration and Machinery Specifications

(a) Ice-Making Plant, Block-Ice 50 kg.

Production	: 15 tons per shift/15 hours
Storage Capacity	: 100 tons below temperature of -5°C
Ancillaries	: Ice crusher, 20 tons/hour, Stowing lift/elevator

(b) Main Coldstorage

Temperature	: -35°C
Capacity	: 150 tons net
Ancillaries	: Stowing Racks for frozen and packed export merchandise

(c) Auxiliary Coldstorage

Temperature	: -5°C
Capacity	: 30 tons
Ancillaries	: Plastic Fish Box, 30kg 300 pcs.
	: Butcher's hangers for 1 ton of assorted meats

(d) Freezer Installations

Contact Freezer	: -50°, 350 kg/shift, 2 sets
Freezing Tunnel	: -45°, 500 kg/shift, 1 set
Ancillaries	: Freezing-pan for I.Q.F. 20 kg, 50 sets
	: Freezing-tray for Prawns/Shrimps 2 kg x 5,200 sets
	: Freezing hanger-Rail and Hock, 40 kg x 10, 1 set

(e) Film-Packery (Fish Sausages) Installation

Production Capacity	: 200 gm x 2,500 pc/7 hours
High-pressure-sterilizer, Mixer-grounding machinery, etc.	: One full set

(f) Machinery Installations

Generators	: 250 KVA x 3 sets
Compressors	: 50 KW x 4 sets
Water-softener	: 50 tons/24 hours 1 set
Over-head water tank	: 10 tons 1 set
Pumping installations	: Various
Electric Current System	: Complete set

Manufacturing

(a) Manual Processing Yars; including housing, total area requirement is about 1/2 ha.

Factory House	: 50 x 50 M, one
Factory House	: 15 x 30 M, one
Store Houses	: 15 x 30 M, three
Private Locker Rooms	: two (male & female)
Toilets & Washing Rooms	: two (male & female)
Canteen	: one

(b) Ancillaries
: Weighing Scales, various, one set
: Tables (stainless sheet covered) for washing, sorting, cutting, etc. one set
: All kinds of gears and instruments, full set

(c) Laborarory for quality control, improvement and research, for experimentation/introduction of new items.

Accommodations and Transportation

(a) Administrative Office

(b) Living Quarters for Senior staff

(c) Lodging Houses for Junior staff

(d) Guest House

(e) Transportation	: Car and jeep 4
- do -	: Lorries 3
Refrigeration Trucks	: 5 tons 3

For estimated Employee Requirements see Appendix 10-4 and for a breakdown of Estimated Amount of Investment for the Fishery Processing Complex see Appendix 10-5: both are attached for reference.

7. Expected Effects

1) Employment Creation

It is estimated that 242 people will be employed at the Fish Processing Plants in the initial stage of the operation. (See Appendix 10-4). As the production expands, more people are expected to be absorbed by the plants. Labor opportunities can be especially be derived from shrimp peeling since one ton of peeled shrimps (each weighing about 15 gm.) will need about 65 laborers (each working for 8 hrs/day) according to experience in India and Malaysia. Since the exportation of frozen peeled shrimp involves a lot of labor and the world market demand for frozen peeled shrimps is quite steady, continuous and scheduled employment is possible.

2) Use of Ice

Ice is not only useful for preserving the freshness of fish, but also as an indispensable device for instant killing of milkfish. With instant death of milkfish immediately after harvest, the loss of fish freshness and aroma will be prevented.

3) Development of Fish Freezing Technology

Frozen milkfish is disliked in the Philippines because the freshness of fish is thought to be destroyed when it is frozen. However, modern technology has overcome this problem. The application of lower temperature -45°C will not harm the delicate texture of the fish's flesh. There is the technical procedure to ensure effective anti-dehydration of the frozen fish. The proposed Fishery Processing plants will demonstrate this and prove that these modern technologies of food processing can be used at low costs.

4) Increase in Production of Fish Ponds

When the frozen milkfish processed with modern technology becomes accepted by the consumers of the Philippines, particularly those of Manila, then the fishpond operation will be given incentive to exploit the maximum productivity of each fishpond. The Bohol Fishing Industry will be the first to experience the great impact of this project, and thereafter the entire aqua-culture industry in the Philippines will gradually be affected. It is contemplated that the current poor production of aqua-culture will increase its maximum productivity only through the increasing demand of the consumer market.

5) Development of Export-oriented Fishery

The existence of the Fish Processing Plants will make it possible to organize the export-oriented industries of such items as, sea-urchin, cuttlefish and squid, octopus and fish roe indicated in Appendix 10-2. The existence of these resources have been confirmed in Bohol Province and Region VII. These items should be taken up in the second phase of development.

6) Demonstration Effects

The existence of the Fishery Processing Complex in the Cogtong Bay area will demonstrate to the fishermen in Bohol the importance of "freshness awareness" of the fish they catch--this is the most important factor in modern fisheries. This sort of demonstration effect will take place quite naturally and rapidly, and the project will then step into the next phase. Since the purchase of tuna fish, big-eye, yellow-fin, blue fins and sail fish will begin. This variety of fish shall be processed into the dressed, loin and "sashimi-packs", etc., where lucrative markets are readily

available in the U.S.A. and Japan. Such activities will comprise the Third Phase of the Project. During this Phase, Bohol will be formulating strategies for the fishing industry to be able to adjust to the prevailing trends in the industry.

8. Implementation Plan

1) Administrative Organization

It is highly advisable that a new organization will be incorporated in order to implement the CBFIC Development Program and manage and operate its actual production. An outline of management and production system required for the CBFIC is given in Appendix 10-4.

2) Technical Advice

In view of the new technology and new marketing methods to be used by the Fishery Processing Complex, it is strongly recommended that the following technical advisers should act as technical consultants on the matters concerning the construction and initiation of production periods mentioned below.

(a) Fishing industry management specialist for 36 months starting his services from the time of the Complex's construction and installation until the initial export transaction is completed.

(b) Refrigeration engineer who has adequate knowledge and experience in operation of all installations including the generator, for 36 months.

(c) Food technologist for film-packery, for 24 months.

(d) Food technologist for frozen items, for 24 months.

Total : 4 persons
Man-months : 120 months

9. Technical Note Regarding Cogtong Bay Fishing Port

It must be understood that the construction site of Cogtong Bay Fishing Port Development Project is not yet decided. A proper choice of the fishing port should only be made after careful evaluation of the alternative sites. As an alternative site for the fishing port, Guindulman port should be also given a consideration. The Cogtong Bay Port is estimated to require a 3,000m long causeway, but no need for a breakwater, whereas Guindulman does not need a long causeway, but requires a breakwater. Furthermore, the geographical situation of Guindulman is rather inconvenient for barrier (fish corral) operators and fishing vessels which would operate along the east of Bohol.

10.9.2 Modernization Program of Fishing Methods in Bohol

Besides the proposed Cogtong Bay Fishing Industry Complex (CBFIC) Development Program, the Authorities concerned are, nereby, reminded the importance of introducing new improvements into Bohol for modernization of her own fishing industries briefly as

- motorization of bancas
- improvement in the construction of fishing boats
- modernization of fishing gear to take the place of crude, non-durable materials
- choice of appropriate fishing gear to be used using survey of Bohol's fishing ground as a guide
- construction of fishing ports

The majority of Bohol's fishermen are still using non-motorized bancas, limiting their fishing on shallow coastal waters and concomitantly limiting their catch as to quantity and quality of fish. This is understood to be due mainly to lack of capital to buy the necessary equipment.

Another drawback is the insistence of people to stick to old methods and practices of constructing fishing boats. Fishermen should be educated about the importance of correct design and specifications of the fishing gear used to fish effectively using the least amount of time, effort and capital. Fishing boats should be designed to complement the fishing and handling efficiency and the durability of the gear. Although there are extension workers assigned by the BFAR, they are appearantly not as effective as possible since they are obliged to have their extension work channeled through the cooperatives.

The most common and widely used material in the construction of fishing gear in Bohol is bamboo. However, it has been studied and proven that synthetic fibers, although initially more expensive, last longer (5-7 years) compared to the bamboo's endurance which is only a maximum of one year. Besides, synthetic fibers are constructed to withstand heavy weather which is the main cause of destruction of gear made of bamboo. Destruction of fishing gear just after construction before-loans have been repaid is a common disappointment of Bohol's small scale fishermen.

Although the sea around Bohol Island is a tuna migratory path, effective fishing gear for this species (one that will catch effectively, but will not deplete the species) is not yet used. Pole and line with live bait should be introduced as already proven effecting by other countries. Although a few people are now using this gear, it has not yet become popular. The coastal waters of Southern Bohol is considered an ideal site to set nets. The present set nets used are old and traditional. Modern set nets should be introduced such as those introduced by the Japanese experts and were found to be effective in test fishing in the Northern Philippines.

Eastern Bohol is suited for trawl fishing for demersal fishes (especially shrimps) due to its bottom conditions. In the South Eastern part of Bohol, improvement of gill nets should be introduced to attain maximum catching efficiency of pelagic species such as flying fish, etc.

To make a more comprehensive scientific and realistic guideline for fishermen as to the fish to catch and the gear to use, a thorough survey of the fishing ground of Bohol should be made. In this manner, specific gear for a specific area could be defined and appropriate measures could be taken.

For the long term, when the above modernization has already been effectively implemented, fishermen will need a common and specified place where they can converge to make their catch ready for market and to refuel their fishing boats, get supplies, make necessary repairs, and shelter their gear and boats in times of bad weather. This is the time when a fishing port must be constructed with adequate facilities ice and cold storage, and at the center of the fishing grounds.

10.9.3 Methods of Distribution of Fish in Bohol

1. Need for Improvement of Coldstorage and Transportation

The practice of fish distribution in the province of Bohol, especially in the towns has seemingly remained unchanged for many years. Fish caught by small scale fishermen are sold to neighbors and the neighboring towns through fish vendors who peddle their fish on bicycles around the neighboring area, covering a range of forty to fifty km. The price of fish sold in this manner is negatively affected by the time and distance of the sale. The longer and the farther the vendors go, the lower the price becomes, due to diminished freshness of the fish and for fear of its being spoiled. Vendors are forced to sell them at very low prices. During harvest and planting seasons of agricultural products, however, when demand for fish is high, consumers from the hinterlands come down and pay higher prices than the usual consumers are paying. Therefore, this method of fish distribution is disorganized and unsystematic. The main drawback to this is the lack of coldstorage and poor transportation facilities on the part of the fish vendors and on the part of the fish consumers. Although there are markets in every town, vendors are forced to go around to hasten the sale of their fish, because there is almost no ice and no storage facilities, and consumers cannot come readily as they desire due to lack of transportation. Fish sold by this manner of distribution also has poor quality due to poor handling while in transit.

Some enterprising vendors have motorcycles with fish containers and travel to the hinterlands to sell their fish where they can demand higher prices. However, they also have the same disadvantages: improper handling and storage. Fish spoil faster due to distance and heat of the sun.

Consequently, distribution of fish in Bohol needs to be improved in order to sell fish with quality at a reasonable price to more people. This can be achieved through improved transportation and cold storage facilities.

2. Need for Shortening Distribution Channel

The price of catch from commercial fishing, on the other hand, is too high due to too many middlemen or retailers, known locally as "labasero". Before the fish are finally sold to the consumers, they pass through 3 to 4 hands, each of them making their own gain, as much as the market will bear.

3. Need for Standardization of Price

"Sugpo" (penaeous monodon) and crabs (Seylla serrato) are bought by middlemen at higher prices than local consumers are paying. They are then transported to Cebu City, Cagayan de Oro City and other cities where prices are double the buying price. The retailers try to assure that catch from fish corrals are exclusively sold to them by putting up capital to the fishermen who are operating these fish corrals.

10.9.4 Improvement of Extension and Loan Services

It is reported that the BFAR Bohol District fishery office has nine extentsion workers covering the whole province of Bohol. There are five extension workers for aqua-culture, one for Fish Processing and three for fish capture. The present set-up is said to be undermanned in trying to render extension services throughout the whole province. Additional extension workers are therefore said to be needed.

Although the Development Bank of the Philippines was extending Fishing Loans to small-scale fishermen years ago, it was dissolved. This was reportedly due to lack of technical men to directly assist the fishermen. Hence at present, the government is extending the "Biyayang Dagat '79" loan scheme with modification to overcome the former defects of the "SELDA" loan scheme. In the present loan scheme, the project to be financed by the "Biyayang Dagat '79 Loan" is directly supervised by the technical men or Extension Workers of the BFAR. Funds cannot be released without the recommendation of the technical men of the BFAR. Most of all, a prerequisite is "Samahang Nayon" membership.

10.9.5 Organization of Cooperatives

Sound functioning of fishermen's cooperative is most important for development of fishing industry of Bohol. To provide adequate marketing and purchasing schemes, as well as, storage and transportation facilities, which are the main problems of the fishing industry in Bohol, there is a need for organized cooperation: a cooperative. A cooperative seeks to consolidate people, their interest, talent and resources. By organizing themselves, they

become stronger and are therefore in a better position to secure benefits for the group, which they could not hope to attain singly or individually. It will provide them with an opportunity to identify and discuss their major problems systematically and take definite steps to solve them. It will help them become self-reliant and increase profits.

Many of the problems that beset fishermen are economic. In a cooperetive, small fishermen will be able to pool their resources to be on an equal footing with other large business enterprises. It will help small fishermen be more secure with their own united capital, services and goods. They need to increase their production and income, efficient management, credit, production supplies, technical know-how, marketing outlets, transport and storage facilities. All these must be established so that fishermen may receive more for what they sell. They must be taught new and scientific ways of doing things and provided with better access to credit at reasonable rates of interest so that by investing more they can catch/produce more. Indifference, fatalism and over dependence are attitudes that will have to be overcome. The root of all these attitudes is said to be that the Boholanos are not yet effectively organized.

Through a fishermen's cooperative, the problems of fish distribution can be overcome. The catch would be bought by the cooperative in bulk at cost, deposited in the ice-cold storage and even in the frozen storage for longer periods to afford a controlled standardized price and a continuous supply of fish regardless of season or weather. Fish could be distributed over a wider area at reasonable prices with improved quality through transportation facilities, where fish are properly stored and handled. In this manner, distribution system of fish in Bohol could be more effectively organized and the interests of small fishermen protected.

Footnotes

1/Fisheries Statistic, Table 30, Page 226, 1976
2/Market Report of Fisheries, Los Angeles
3/Census of Fisheries, Table II. B. 27, Page 60, 1971
4/BA Chart, No. 3825
5/BA Chart, Naming of Banks, No. 3825
6/Cogtong Bay is described in BA Pilot Book 33 as: "The head of the bay is situated approximately at 124°32'E and 09°51'N, and located between Lamanoc point and Cabulao (Kabulao) point, it is nearly filled in its outer part with low islets covered with mangroves. Lumislis islet is connected by a reef, which dries, to the northern shore, and there are three islets connected by reefs, which dry, to the southern shore. The shores of the bay are generally bordered with mangroves. A reef, awash, 6 cables (about 1,017 m) southward of Lumislis islet, is the only detached danger in the bay ... Good anchorage, sheltered from winds except from southeast, may be obtained by vessels with local knowledge southward and westward of

Lumislis islet, where there is a depth of 10 fathoms (18m 3), mud shoaling to 2-1/2 fathoms (4m 6)".

It is said that there is almost no strong southeast wind blowing, but occasionally, a gentle southeast breeze blows in the months of July and August. Whatever it might be, during the course of a field survey, there were two ideally sheltered locations that were spotted as fishing ports of Bohol. Cogtong Bay is the first one and the second is the landing site about 5-1/2 km. east of Ubay Municipality along the western bank of Basiao Channel facing Lapinig Island. Today, there is no port facility at Cogtong except for the natural shelters which have good water depth for the vessels' safe anchorages. However, there is a lighthouse under construction. No information is available on when the service will start. A small concrete paved landing apron will be used to serve boats whose drafts must be very shallow about 1/2m as maximum; however, the landing site is at the end of an unpaved road connected to the Town of Candijay about 6km west.

APPENDIX

Climatic Conditions of Cebu Area

Month	Pressure at M.S.L	Rain		Wind direction																		Mean wind speed	No. of days with wind speed more than force 8	No. of days with fog or mist.
				Percentage of observations from									Percentage of observations from											
	Mean (mb)	Average fall (in)	No. of days with 0.04in or more	N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm	Mean of day (knots)		
January	1010	4.2	11	70	12	0	0	0	0	1	2	15	18	72	5	1	1	1	0	2	0	6.9	0.5	–
February	1011	2.9	7	63	15	0	0	0	0	0	5	17	12	77	4	1	2	1	1	1	1	6.8	0.1	–
March	1010	2.0	6	63	18	2	0	0	0	1	1	15	7	80	7	1	2	1	0	1	1	6.9	0.2	–
April	1009	1.7	5	45	17	1	0	1	1	2	3	30	6	76	7	2	4	1	1	2	1	6.3	0.4	–
May	1008	4.5	9	23	10	1	1	1	14	6	5	39	7	42	7	5	28	7	1	1	2	5.5	1	–
June	1008	6.4	13	14	5	0	2	2	22	8	7	40	3	26	5	8	41	12	1	2	3	5.6	2	–
July	1008	7.3	15	5	3	1	1	5	52	9	6	18	2	10	3	6	45	27	2	1	4	7.6	7	–
August	1008	5.6	12	5	1	1	0	2	56	10	5	20	2	9	3	5	50	25	1	2	3	8.0	7	–
September	1008	6.9	13	4	2	1	1	3	46	13	4	26	2	10	3	5	44	25	3	2	6	6.7	4	–
October	1008	7.7	15	23	3	0	0	3	24	9	9	29	5	30	7	5	24	18	4	2	5	5.9	2	–
November	1009	6.4	11	40	9	2	1	2	8	3	6	29	7	52	7	2	15	9	1	2	5	5.9	1	–
December	1009	5.0	10	57	14	0	0	1	4	3	2	19	14	60	8	2	7	4	1	2	2	6.3	0.4	–
Means	1009	–	–	34	9	1	0	2	19	5	5	25	7	45	5	4	22	11	1	2	3	6.5	–	–
Totals	–	60.6	127	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	26	–
Extreme values	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
No. of years' Observations	15	36	10	←									10	→								27	15	–

Source : M.S. Data supplied by Weather Bureau, Manila.
Manila, Annual Report of the Weather Bureau.
Place – Cebu, Lat, 10°18'N. Long. 123°54'E.
Height above Mean Sea Level, 30 feet.
Climatic Table Compiled from 10–15 Years' Observations, to 1957.

Japan's Import of Marine Products 1978 from South-Asian Countries (Selected Items only)

Unit : ¥1,000 CIF Japan
Exchange Rate : About US$1 = ¥210 = ₱7.25

	Skipjack		Lobstars		Shrimps & Prawns		Squid & Cuttlefish		Sea-Urchin		Fish Roe		Octopus	
	kg	Value	kg	Value	kg	Value	kg	Value	kg	Value	kg	Value	kg	Value
Philippines	877,750	120,939	25,845	44,693	2,791,197	4,741,060	473,233	357,969	110,540	53,654	--	--	--	--
Hong Kong	868,140	114,925	43,654	103,300	4,607,979	8,667,372	549,263	265,422	17,244	76,612	--	--	--	--
Thailand	--	--	--	--	8,377,476	12,355,985	10,120,837	5,804,740	--	--	--	--	2,955,860	485,566
Malaysia	--	--	--	--	6,506,016	8,628,289	1,317,900	757,712	--	--	--	--	--	--
Singapore	--	--	--	--	374,124	564,881	1,352,789	393,600	--	--	10,080	1,832	10,080	1,832
Indonesia	--	--	501,622	1,104,678	28,337,984	42,832,007	300,338	148,337	--	--	153,519	905,519	9,192	1,675
India	--	--	283,442	603,102	31,580,602	35,451,246	247,561	129,247	--	--	--	--	--	--
Taiwan	185,524	27,774	26,270	76,138	5,566,785	7,331,415	3,857,666	2,724,506	109,852	98,150	128,095	166,874	215,640	67,394
Total Imports World-wide		860,839 (0.1%)		12,825,829 (1.9%)		209,702,338 (31.0%)		42,590,127 (6.3%)		4,947,363 (0.7%)		1,099,044 (0.1%)		25,859,679 (3.8%)

Japan's Total Marine Products Import 1978 : 674,700,000

Source – Japanese Customs Authority's Releases, 1978

OPERATIONAL PROGRAM AND ECONOMICS FOR FISHERY PROCESSING COMPLEX

1. Ice Making Plant

1.1 ICE REQUIREMENTS

Under tropical conditions, it is generally reported that the tonnage requirement of ice to fish is on the ratio 1:1, from the time of hauling to the hand of the consumers. Since Bohol's landing was reported as 29,770 tons in the year 1976, the requirement of ice, is about 81.56 tons daily. Since Bohol's fishery landings are mainly the municipal fisheries who fish in nearby waters, the fish are destined for immediate consumption, and traditionally conducted fisheries distribution is almost without ice. Therefore, the requirement of ice at the initial stage may be half of 81.56 tons, of which the existing ice plants at Tagbilaran and Tubigon may cover 2.5 MT consequently, 15 MT will be covered by the project.

Besides covering the reported landings, the project is planned to initiate a processing business for export oriented merchandises. Such being the case, the envisaged production of ice 15 tons a day (shift) is quite nominal for covering the potential demand by Bohol fisherys.

It is highly recommendable to maintain the price of ice at the lowest possible level, so that the local fishery can afford it, but, high enough too avoid strong competition with existing privately owned ice making plants.

1.2 PRODUCTION OF PRICING

For the first year, 300 days operation a year and production ..... 4,500 tons

Revenue: @₱100 per ton or ₱5 per 50 kg slab ex-factory ..... ₱450,000

(Note)

It is envisaged to make production capability 15 tons per shift (abt. 17 hours). As the demand for ice increases and factory workers are well trained, the potentiality of ice-plant should be expanded as follows:

24(hours) x 365 days = 8,760 (annual hours):

17(hours, actual freezing time) + 3 (preparation and day-off reservation hours) = 20 (hours per shift):

15 tons x (8,760 ÷ 20) shifts per year = 6,570 tons

₱100 x 6,570 = ₱657,000

Therefore, the above production 6,570 tons will be regarded for the third year with the production of the second year 5,535 tons (by interpolation).

2. Freezing Departments

2.1 SCOPE FOR FREEZING REQUIREMENTS

(a) Frozen Shrimps

The world's biggest frozen shrimps (prawns) importer is Japan. In the year 1978, Japan's imports were recorded at 144,000 tons, followed by USA with a record of 75,000 tons. The major supplying countries for Japan were: India 32,000 tons, Indonesia 28,000 tons, China 19,000 tons, Thailand 8,000 tons, and the Philippines only about 2,790 tons. Within a decade, Japan increased her imports from about 60,000 tons, and over-supply has never been experienced. The frozen shrimp business is, more or less, regarded as one of the most steady industries naturally subject to foreign exchange and speculative positions.

Although FAO indicated that the Maximum Sustainable yield of world shrimp production was 1,487,000 tons, the actual catches were recorded as 1,446,000 tons in the year 1970. It is regarded that the Philippines in one of few countries which can exploit the potentiality from now onwards.

The total sales of frozen shrimps in Tokyo at the end of June 1979 were reported as follows:

WHITE (P. indicus), Indian origin, processed by shore installation, 2 kg slab, Head-off.

- Count -	- Price -
11/15	¥6,600
16/20	6,300
21/25	5,700
26/30	5,500
31/35	4,700
36/40	4,400
41/50	3,400
51/60	2,500
61/70	2,000
71/90	1,500

TIGER (P. semisulcatus), Indonesian origin, processed on board trawler, 2 kg slab, Head-on.

U/10	¥6,600
11/15	6,700
16/20	6,700
21/25	6,500
26/30	6,200

RAW PEELED, Indonesian, 2 kg slab

80/120	¥1,900
100/200	1,500
200/300	1,200
300/500	800

I.Q.F. (Individually Quick Frozen) 1 kg pack,

80/120	¥1,150

(Note)

"Count" means number of pieces in one pound (453 gms).
"Head-off" means without head but shell and tail on and not de-veined.
"Head-on" means whole shrimp but count presumed as if head-off.
"Raw Peeled" and "I.Q.F." are usually out of raw shrimp with black-spot (slightly), the first sign of deterioration, but fresh enough without mal odor.

(b) Fishes and Animal Meats

At the initial stage, there will be no fish to be frozen because of the prevailing unpopularity of frozen fish in the Philippines.

Frozen milkfish is not well accepted in the Manila market yet. However, if the fish is frozen at a temperature below -45° while fresh and packed in good shape and treated for anti-dehydration, it is expected to gain acceptance in the market. Nevertheless, it will take time, Therefore, it is safe to plan on no revenue, but only experiment and research for the first year. Similarly with animal meats. Although there is no modern slaughterhouse facility in Bohol today, the need for a meat-freezing or chilling industry will arise in due course of time since Bohol is exporting livestock today.

From the second year onwards, after completion of the Project, there will be demand for freezing/chilling fishes and meats for shipment to the Manila market and substantial commercial freezing of other items, such as, tuna fishes, squid, cuttle-fish, octopus, other marine species and poultry products.

2.2 EARNINGS ESTIMATED

2.2.1 The First Year

(a) Freezing Service by Installations

Shrimps and Prawns, 600 tons, @₱3.50 a kilogram
200 days each 3 tons a day, ... ₱2,100,000.

(b) Labourers

Sub-contractors department, 52 man-days for processing one ton for freezing, 31,200 man-days for 600 tons' finished products. Charges at cost.

(c) Packing materials, transportation and other items at the cost.

Coldstorage Rents

i) Ice-chilled coldstorage -5°C
30 tons capacity, utilization ratio 60%,
Rent ₱1.50 per 20 kg a day, for 365 days..... ₱492,750.

ii) Frozen coldstorage -35°C
150 tons capacity, tarrif ₱450 per 1,000 kg of shrimps (prawns) a term (15 days).
Average period of storing for 2 terms.
₱450 x 2 (terms) x 600 (tons) ..... ₱540,000.

2.2.2 The Second Year

(a) Freezing Services by Installations

Shrimps and prawns, for 750 tons, for 250 days
at ₱3.50/kg ..... ₱2,625,000.

Other items, 90 tons @₱1.50 a kilogram
30 days each 3 tons a day ..... ₱135,000.

(b) Labourers

For shrimps and prawns, 31,200 man-days will remain the same. For other items, unit of man-day for one ton is expected 43, and annual man-days is 6,450. Both will be charged at cost.

(c) Packing materials, transportation and other items will remain at cost.

(d) Coldstorage charges

i) Ice-chilled coldstorage -5°C
30 tons capacity, utilization ratio 70%
Rent ₱1.50 per 20 kg a day, for 365 days .....₱574,875.

ii) Frozen Coldstorage -35°C
Prawns, shrimps and other items total 780 tons, tarrif and terms will remain the same.
₱450 x 2 x 780 ..... ₱702,000.

2.2.3 The Third Year

(a) Freezing Service by Installations

Shrimps and prawns, same as previous year as 750 tons ..... ₱2,625,000.

Other items, 180 tons @₱1.50 a kilogram 60 days each 3 tons a day ..... ₱270,000.

(b) Proportionate increases but will remain at cost.

(c) Same as above.

(d) Coldstorage charges

i) Ice-chilled coldstorage -5°C
30 tons capacity, utilization ratio 80%
Rent ₱1.50 per 20 kg a day, for 365 days .. ₱657,000.

ii) Shrimps and prawns 750 tons and other items 180 tons; total 930 tons ..... ₱837,000.

3.1 PROSPECTS FOR FILM-PACKERY/CANNERY

This is a part and parcel of the fishing industry in general. The Philippines is known for consuming canned fishes of more than 2 million cases (equivalent to about 29,000 tons of dressed fish) a year, and domestic production was reported at a little less than one million cases for the year 1977. Such being the case, the Philippine Government would have been obliged to issue Import Licences for 1.3 million cases for the year 1979: a substantial drain of precious foreign exchange for the Philippines. It is presumed that the reason for the insufficiency of canned fish in the Philippines was the exorbitant cost of the being imported at very high cost. This irregularity of tin raw material supply may be overcome by installation of suitable frozen coldstorage; however such facilities will take time to install.

Another solution is to consider substitution of tin-cannery by film-packery using vinyl or prastic casing in place of tin. This technology is well established in Japan. Without a chemical compound preservatitive, but by heating ingredients alone and utilizing certain spices, it has been proven safe edibility at least for 6 months, even under tropical temperatures; institutional canned foods last about 2 years. Originally, film-packery was for processing preserved food-stuff mainly a mixture of whole-meat and tuna-fish. The advantage of film-packery is less water content and more substantial protein than canned stuffs.

Even the cheapest or stiffest portion of beef, buffalo meat and mutton, all readily available in Bohol, are suitable and better than whole meat. The texture of flying-fish, a very common species

available throughout year in abundance in Bohol waters, is as good as tunafish. Therefore, the film-packery is believed to be quite feasible in Bohol. Although the technology of film-packery was developed in Japan, it is absolutely necessary for conducting research for ascertaining the suitable marketing mixture of spices and seasoning for taste of the Philippine market prior to mass-production. Consequently, the initial stage of production is limited to only 100 working days a year.

3.2 PRODUCTION COST

The prices of Raw Materials are taken in reference of Tagbilaran market:

Meat with bone : ₱6/kg
Flying Fish, whole : ₱4/kg

Their yield rates are about 64% and 40% respectively, therefore, their net-yield prices and their tentative mixing ratios are as shown as follows:

Meat ₱9.38/kg 37%
Fish ₱10.00/kg 60%

The remains 3% may be filled with such things as additives and shape-forming Starch, Gelatine, Fat/Lard, various Spices and Seasonings whose total cost is estimated at about ₱1.50.

Thus, the cost of raw ingredients is estimated at about ₱11.00 per kg and ₱5,500 per 500 kg.

The direct labour cost for yields of 500 kg of ingredients are reckoned as follows:

Fish cutting	14 persons
Meat cutting	4 "
Additive	2 "

The total 20 persons' wage is abt. ₱300/500kg/day.

The actual costs of films (casings), inner-packet and master-carton are based on the Japanese market, though they might be available in the Philippines at cheaper prices:

Film casing 200 gm, @₱3.50 per 10 (2 kg) for 500 kg of "sausage"	₱875
Inner Packet (2 kg) @₱1.00	150
Master carton (20 kg)	125
Other packing materials	50
Sub-total	₱1,200

It is quite difficult to estimate the monthly cost of "overhead, factory and other relevant expenses", but tentatively reckoned as ₱1,250/day.

The total production cost of 200 gm/pc "sausage" for 500 kg is estimated at ₱8,280 and each piece of 200 gm is ₱3.312. By addition of cost for wholesellers and retailers, it will be not more than ₱5.00 per piece which deemedly accessable to any person in the Philippines.

Nevertheless, the above "overhead" (₱1,250) may be counted as revenue to the Project, since they will be charged as a service cost, they may be reckoned as ₱250,000. per annum (200 days of operation)

4.1 PRE-CONDITIONS

The following computations are subject to the following conditions.

(a) The total requirements of "investment" ₱3,482,775. in "complex and initial running fund" about ₱500,000 are subject to no obligation of repayment during the first stage of three years for either principal or interest.

(b) Expenses for a foreign Technical Team are not included.

(c) No expense for the fishing port is included. Acquisition cost of land and installation of access road are not included.

(d) The Fishery Processing Complex is scheduled not to conduct activities such as trade, procurement of raw materials and other business transaction, but will be limited to:

i) Manufacturing ice and disposal at cost

ii) Rendering freezing services

iii) Renting coldstorage space both ice-chilled and frozen

iv) Rendering film-packery services

4.2 PARTICULARS OF COSTS (1st year)

(a) Depreciation

The period and term of depreciation should be appropriate to each specific them, such as ice-making plant and coldstorage (longer periods) and transportation (shorter period). Nevertheless, it is estimated here at a fixed amount by ₱233,000, approximately 1/15 of ₱3,482,775.

₱233,000.

(b) Salaries, wages and Bonus for 72 persons (sub-contractors' staff excluded)
monthly ₱57,600 x 12 ₱691,200.

Retrenchment, welfare and personnel insurances, etc. 10% ₱69,120.

(c) Fuel, power and Energy:
Daily about @₱2,500 for 365 ₱912,500.

(d) Insurances and Maintenance about
5% of ₱3,482,775 ₱174,000.

(e) Stores and Materials, supplies about
2% of ₱3,482,775 ₱70,000

Based on the revenues and costs mentioned in detail previously, the following P/L Statement was calculated.

Profit-Loss Statement (1st year)

Income		
Freezing Services	2,100,000	
Cold Storage (Frozen)	540,000	
" (Ice Chilled)	492,750	
Sales of Ice	450,000	
Packery Service	250,000	
Sub-Total		3,832,750
Expenses		
Power	912,500	
Personnel	760,320	
Depreciation	233,000	
Insurance & Maintenance	174,000	
Stores	70,000	
Sub-Total		-2,149,820
Provisional Pre-Tax Profit		1,682,930

ESTIMATED EMPLOYEE REQUIREMENTS FOR FISHERY PROCESSING COMPLEX

MANAGEMENT ORGANIZATION AND LABOR FORCE

Policy making and/or supervisory board may be formed, under which the management organization will execute the day-to-day business.

Senior Staff:

General Manager-cum-Administrator	1
Technical Officer	1
Finance Officer	1
Electrical Engineer	1
Laboratory Research Officer	1
Security Officer	1
Sub-total	6

Junior Staff (A Class):

General/Supplies Departments	2
Accounting Department	1
Storekeeper	3
Ice-Producers	2
Food Technologists	2
Machinery Engineers	4
Business Attendants	2
Sub-total	16

Junior Staff (B Class):

Clerks, Typists, Vehicle Drivers, Security-guards, Engineroom Staff, Researchers, etc.	24
Other Ranks (permanent employees)	40
Sub-total	64

Sub-Contractors' Department

Foremen & Forewomen	6
Part-time Workers	150
Sub-total	156
TOTAL :	242

ESTIMATED AMOUNT OF INVESTMENT FOR FISHERY PROCESSING COMPLEX

Refrigeration and Machineries

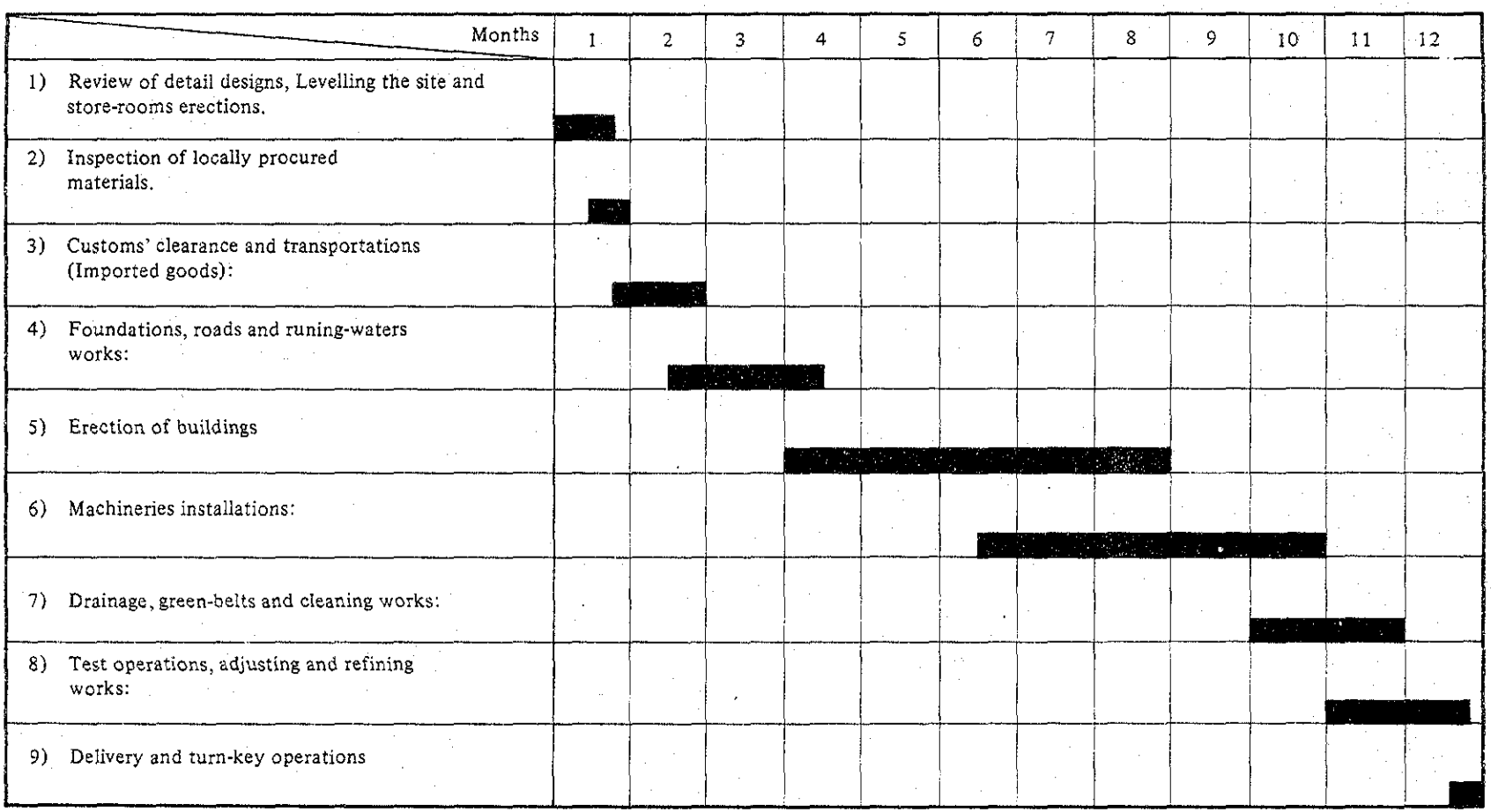
	FOB JAPAN (US $)	LOCAL COST IN BOHOL (US $)	(₱ rate 7.30)
Ice-making plant	234,500	106,000	(₱ 773,800.00)
Main Coldstorage	85,000	37,000	(270,100.00)
Aux. Coldstorage	31,500	16,000	(116,800.00)
Freezers	15,000	9,500	(69,350.00)
Film Packery	250,000	145,000	(1,058,500.00)
Machineries	367,500	75,000	(547,500.00)
Sub Total (1)	983,500	388,500	(2,836,050.00)

Manufacturing Buildings and Transport

	FOB JAPAN (US $)	LOCAL COST IN BOHOL (US $)	(₱ rate 7.30)
Manual Processing Yards	75,000	687,000	(₱ 5,015,100.00)
Ancillaries	12,000	3,500	(25,550.00)
Laboratory	11,500	27,500	(200,750,00)
Accommodations	-	675,000	(4,927.00)
Transportation	90,000	75,000	(547,500.00)
Sub Total (2)	188,500	1,468,000	(10,716,400.00)
Total (1) + (2)	1,172,000	1,856,500	
Contingencies	175,800	278,475	
Grand Total	1,347,800	2,134,975	

US$3,482,775 (₱25,424,000)

Program of Construction Cogtong Bay Fish Processing Plants



CHAPTER 11
MINING AND MANUFACTURING INDUSTRY DEVELOPMENT PROGRAMS AND PROJECTS

CHAPTER 11 MINING AND MANUFACTURING INDUSTRY DEVELOPMENT PROGRAMS AND PROJECTS

11.1 Background of Mining and Manufacturing in Bohol

11.1.1 Mining

Bohol is relatively rich in non-metallic minerals such as limestone, silica, feldspar, clay, sand, gravel and guano. More than half of the island is covered with limestone. The major limestone quarrying is the Philippine Sinter Corporation of Garcia Hernandez with an annual capacity of 1,000,000 tons. Guano deposits formed by bat's dropping in the calcareous caves are widely found over the island. They range from Banlasan, Trinidad (northeast), and Kabidian Mabini (west) to Jimillian and Loboc. Each of the deposits, however, does not exceed 25 tons. Silica sand abounds in the northeast coast of Ubay-Trinidad-Talibon-Jetafe belt. Production of major minerals are shown in the table below.

Table 11.1 Major Mineral Production in Bohol (1974, 1976, 1977)

(Unit: MT)

Mineral or Product	1974		1976		1977	
	Q'ty	Value (000₱)	Q'ty	Value (000₱)	Q'ty	Value (000₱)
Limestone	-	-	21,700*	181.2	506,455	4,699.8
Silica Sand	11,200	175.1	9,688	147.2	1,230	51.5
Clay	-	-	500	12.5	946	170.7
Feldspar	-	-	-	-	406	55.6
Salt	6	1.3	3,881	1,808.5	4,746	1,948.9
Total Major Minerals	11,206	176.4	35,796	2,149.4	513,783	6,926.5

Source: Mineral News Service Nos. 71-73. Bureau of Mines.

* Estimated based on 11,414 m^3.

The staratigraphic column for Bohol is as follows:[1)]

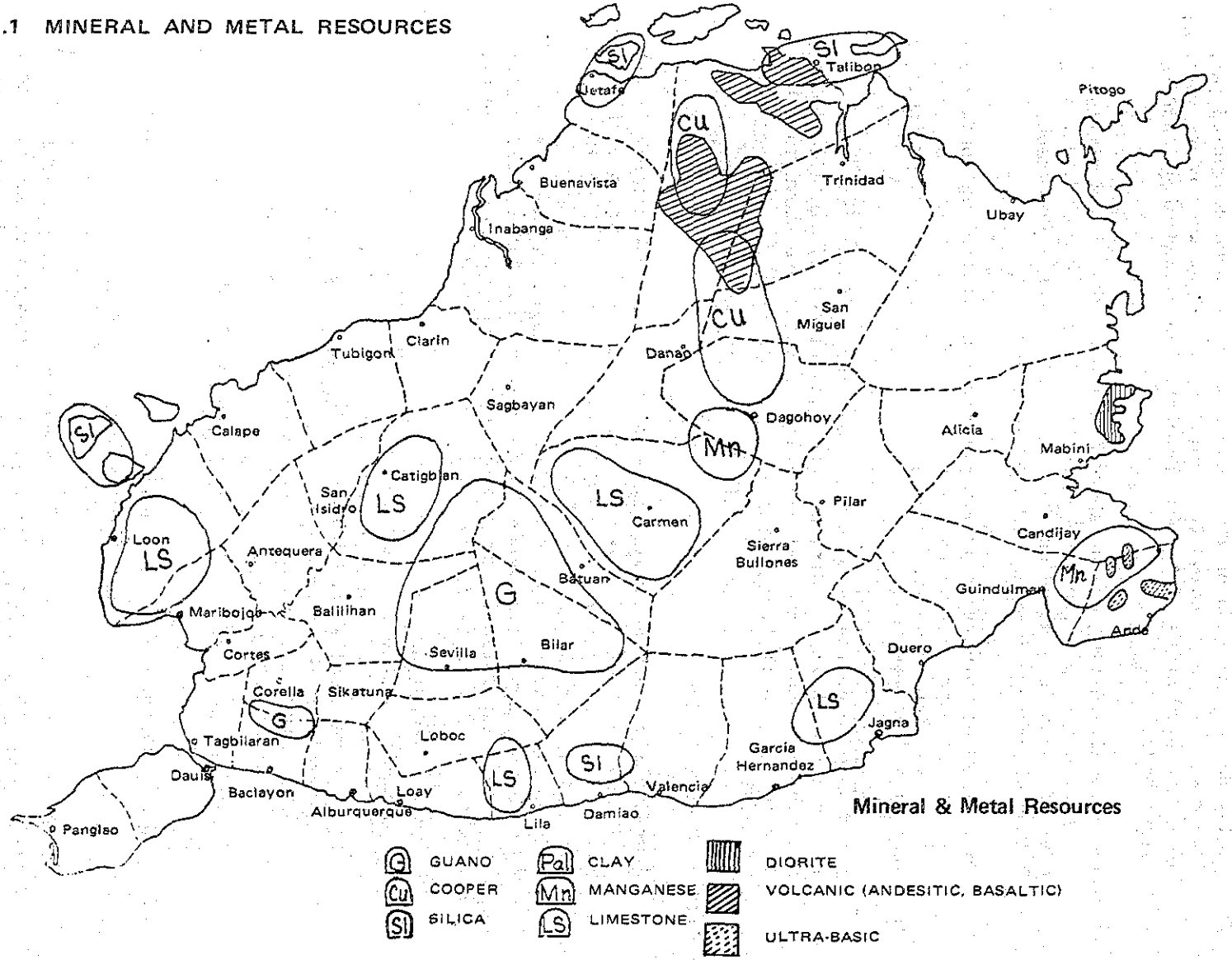
- Alluvium (Quaternary)
- Calcar Limestone (Tertiary Z)
- Sevilla Marl (Tertiary Upper X)
- Sierra Bullones Limestone (Tertiary Upper X (?))
- Tubigon Conglomerates (Tertiary Middle X (?))
- Carmen Orbitoid Limestone (Tertiary Middle X)
- Wahig Orbitoid Limestone (Tertiary Upper W)
- Unnamed Limestone south of Tubigon (Tertiary U)
- Basement Complex

Table 11.2 MAJOR METALLIC AND NONMETALLIC DEPOSITS

Minerals	Name of Mine/Prospect	Location	Estimated Ore Reserves (MT)	ESCAP Classif.
Clay	Explored Deposit:			
	Jetafe Mining Co.	Jetafe	53,900	III
Silica Sand	Producing Mine:			
	Modesto Hernandez Silica Property	Jetafe	445,600	III (placer)
	Explored Deposits:			
	Diamond Cement & Industrial Corp.	Jao Is., Talibon	1,001,500	II
	San Francisco-San Isidro Silica Sand Prospect	Talibon	1,200,000	II
	Sta. Magdalena Mines	Ubay	1,476,000	II
Limestone	Explored Deposit:			
	Tubod Monte Limestone	Jagna	108,000,000	I
	Producing Mine:			
	Philippine Sinter Corp.	G. Hernandez	895,000,000	I
Copper	Workable Deposits with Non-Indicated or Unknown Reserves:			
	Laka Balisog Copper	Balisog	Unknown	-
	Jetafe Copper	Jetafe	"	-
Manganese	Abandoned Mine: (Ceased Operation in 1962)			
	General Base Metals	Guindulman	1,600,000	I

Source: Bureau of Mines, Manila Information Circular No. 22

Fig. 11.1 MINERAL AND METAL RESOURCES



Prospects for metallic deposits are not yet well known except for the manganese deposit at Guindulman and Anda because no extensive geological exploration of the whole island has been conducted yet. However, it is to be noted that small outcrops of copper are observed along the boundaries of Carmen, Dagohoy, Danao, San Miguel and San Isidro belt.

The tectonic setting of the above area shows that it is similar to the basement complex setting of central Cebu, where an older sequence of volcanic and sedimentary rocks of probable Cretaceous-Paleogene age are intruded by diorite stocks.

In thie area, porphyry copper mineralization lies along contact between diorite and meta-volcanics. Good copper value is associated with zones rich in quarts, sericite, secondary biotite, pyrite, and magnetite[2].

It is also noted that some surface outcrops of manganese are known at the municipality of Carmen. Some indication of ilmenite is also observed in Bohol. Mineral and metal deposits are shown in Table 11.2 and Figure 11.1.

11.1.2 Manufacturing

Almost all of manufacturing establishments in Bohol are small scale cottage industries. Of the 746 registered manufacturing establishments, 144 or 19% are concentrated in Tagbilaran City. Each of the remaining municipalities has less than 8% of the total number. Of the small scale industries, 29% are located between Talibon and Loon. As seen in Figure 11.2, however, industries are fairly well distributed over the island. The employment by type of manufactured product as of 1975 is as follows:

Food, Beverages	6.8%
Textile, Apparel	78.0%
Furniture, Wood and Paper products	9.3%
Printing, Leather and Rubber products	0.5%
Mineral and Metal products	2.2%
Machinery and Transportation Equipment	2.5%
Miscellaneous	0.7%

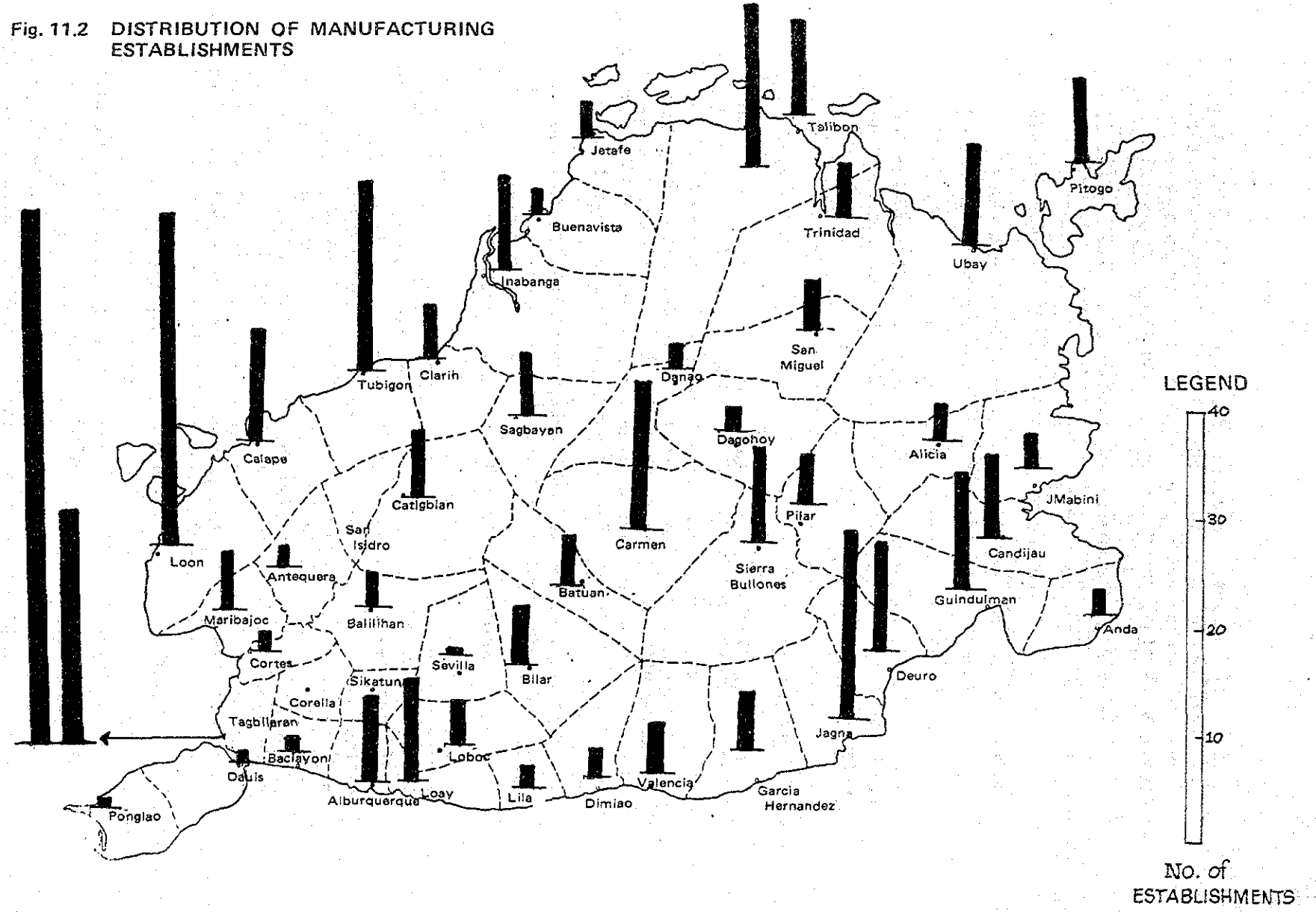
(Source: NCSO)

11.2 Analysis of Current Problems and Trends

11.2.1 Mining

As of 1978 Bohol had only five concessionaries engaged in mining and quarrying: one in clay quarrying, one in limestone, and the others in silica sand. The clay mine of Jetafe has an estimated reserve of 53,900 M.T. with a high Kaolin content. One of the largest limestone mines of Garcia Hernandez with an estimated reserve of 895,000,000 M.T. produces 800,000 M.T. of limestone which has a calcium oxide content

Fig. 11.2 DISTRIBUTION OF MANUFACTURING ESTABLISHMENTS



of 55%. The estimated reserves of concessions for silica sand range from 450,000 M.T. to 1,500,000 M.T. No recorded metallic ore production is observed during 1976 - 1979. The reasons for the low mining activities, hence irregular production, are as follows:

- Lack of systematic and extensive mineral ore survey and exploration
- Lack of local capital to be invested in surveys and exploration
- Lack of introduction of mechanization in mineral ore quarrying.

As for metal mining, one private company has a concession for 1,600,000 M.T. of manganese (content 20%), but is presently not operated.

11.2.2 Manufacturing

1. Problems of Small-scale Industries

As for the total annual volume of sales of cottage industries, Tagbilaran City produces around ₱3,000,000 followed by Loon with ₱1,500,000 and Calape ₱1,000,000. The total annual volume of sales in Bohol of cottage industries amounts to ₱10,000,000 and is concentrated in the area along the Tubigon-Tagbilaran belt.

Shown below is the typical cottage products in Bohol and their annual production scale and volume of sales.

Table 11.3 Cottage Products in Bohol

(Unit: Pesos)

Cottage Products	Production Scale	Range of Volume of Sales	Average Unit Price
Raffia	5,000-12,000 roll	500-300,000	17.5/roll
Mats and sacks	5,000 pcs	60,000	12.0/pcs
Bolo	100-600 doz	6,000-42,000	33 /doz
Pump boats	20-60 units	70,000-60,000	880 /unit
Pails, water tanks	100-600 pcs	2,000-23,000	24 /pcs
Furniture	70-150 units	10,000-40,000	260 /unit
Pants and shirts	30-2,000 doz	3,000-26,000	160 /doz

Source: NACIDA, Central Visayas Reg. Inst., 1979

The annual volume of sales of the registered cottage industries is estimated to be ₱10,260,000.

The variance in the types of products is noticeable. The products range from simple metal work (rice threshers, pails, bolos, wind grills) to foods (bakalina, ampao, empanada, bread), fabrics and

fabricated materials (saguran, raffia, bakya), furniture (aparader & sala sets), handicrafts (mats, baskets, bags), and ceramics (tiles, hollow blocks).

There is also variance in the volume of production, the largest figure being more than ten times the smallest one. This relatively large difference observed in the production volume comes from the difference in the number of workers employed or in the number of contract workers per unit.

The intra-industry commodity flow observed in well developed industrial zones is not yet identified in Bohol.

The location of manufacturing establishments are rather dispersed, indicating that the acquisition of input materials and distribution of products are not critical factors.

The low capital labor ratio together with low electricity consumption seem to be the main factors hindering an increase in productivity.

As the industry is targeted to grow at an annual compound rate of 6% - 9% (refer to chapter 6), an increase in productivity is considered to be essential.

Current problems facing cottage industries include:

- Lack of planned production which stems mainly from irregular demand. Productions is usually made on an order basis placed by middlemen.

- Lack of incentives to organize and integrate cottage industries into larger productive units.

- Lack of incentives to introduce mechanization into the production process.

- Lack of systematic analysis of the market demand.

It is needed that medium-scale establishments should be introduced into the island's economy to have the benefits of scale of economy and to raise productivity. In this respect the introduction of agro-based industries and foot-loose industries of medium scale should be promoted.

2. Problems of Large Manufacturing Establishments

Bohol has a very limited number of "large" manufacturing establishments; there are only five establishments with more than 20 workers according to the 1974 annual survey of establishments.

The following figures compare the state of large establishments of Bohol with that of Region VII.

Items / Name of Region	Number of Large Manufacturing Establishments	Average Number of Employees	Average Consumption of Electricity per Establishments (1,000 KWH)	Capital-Labor Ratio (₱1,000/person)	Volume of Sales per Employee (₱1,000)
Bohol	5	45	126	2.409	25.4
Region VII	171	116	5,314	25.949	138.2

The three indicators, capital labor ratio (CL ratio), volume of sales per employee, consumption of electricity per establishment show the retarded state of industry in Bohol; they are within one fifth of the Regional figures.

The national statistics indicate the existence of two groups of industries: the one having high CL ratio and per capita value added of more than ₱6.3 thousand, and the other having low CL ratio and per capita value added of less than ₱9.7 thousand.

As seen in Fig. 11.3, the industry group comprising corn mill, manufacturers of wearing apparel, wood carving and crafting, manufacturers of rattan furniture, and manufacturers of ceramics have a CL ratio between 500 - 400 pesos and per capita value added ranging from 3,100 - 9,700 pesos. The industry group consisting of canning and perserving fish, coco-oil mills, rice mills, quick freezing of fish & other sea foods, and manufacturers of industrial chemicals have a CL ratio between 10,000 - 120,000 pesos and per capita value added ranging from 6,000 - 60,000 pesos.

None of the industries belonging to the latter group exist in Bohol while industries belonging to the former group are commonly found.

To raise the domestic production by ₱22.7 million by CY 1985, ten large manufacturing industries having CL ratio of more than ₱25 thousand and number of employees of more than one hundred should be introduced into the island as increase in net provincial product during 1980 - 1985 period is expected to come from large manufacturing establishments.

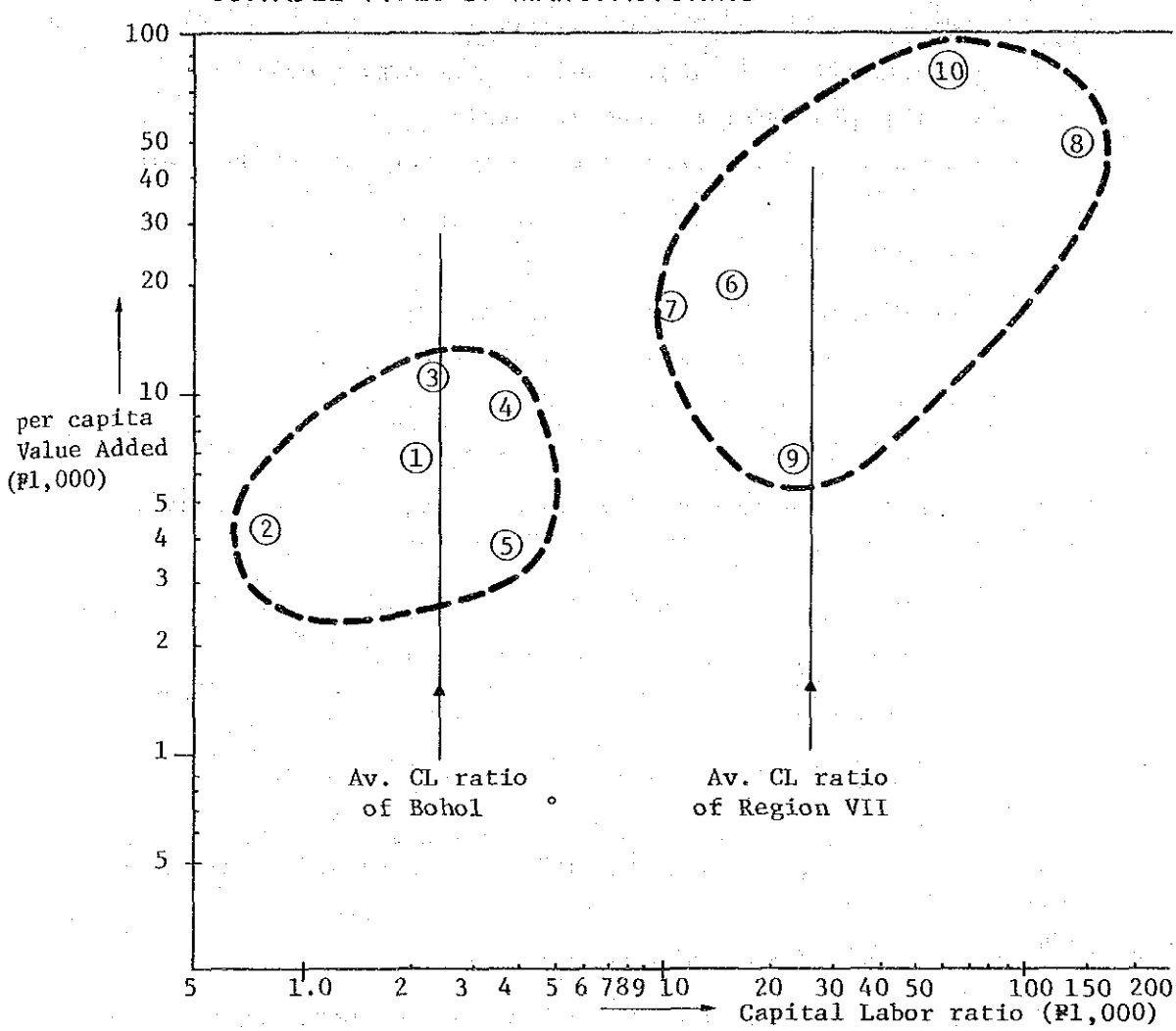
11.3 Development Potentials

11.3.1 Problem Structure

It must be recognized that development potentials of the industrial sector of Bohol should be evaluated within the context of its strategic position to Cebu. The economic dominance of Cebu over Bohol is evident in various respects: agglomeration of establishments, the dimension of market, distribution system, etc.

The resources and constraints for the development of the secondary industry in Bohol are:

Fig. 11.3 CAPITAL LABOR RATIO VS. PER CAPITA VALUE ADDED BY SUITABLE TYPES OF MANUFACTURING



① Manuf. of wearing apparel

② Wood carving and crafting

③ Manuf. of rattan furniture industry upholstered

④ Corn mill

⑤ Manuf. pottery, china, earthenware

⑥ Quick freezing of fish & other sea foods

⑦ Canning, preserving of fish

⑧ Coco-oil mills

⑨ Rice mill

⑩ Manuf. of industrial chemicals

Source: 1974 Annual Survey of Establishments, NSCO.

(a) Resources:

- Potential by large labor supply
- Availability of fishery and agricultural products
- Indigenous water and energy supply
- Relatively large area existing for potential industrial location

(b) Constraints:

- Lack of industrial infrastructure
- Lack of opportunities for skill training
- Lack of local capital
- Less developed land transportation system.

The potential for development of mining and manufacturing in Bohol should be assessed from the following criteria:

(a) Inter-industry linkages:

Backward and forward linkages should be checked to see if the potentiality for further industrial linkages could be strengthened.

(b) Capital labor ratio:

The ratio must be used as a measure and indicator for productivity as well as for the extent of industrialization.

(c) Scale of economy:

To some manufacturers the scale of production is critical. Manufacturing factories must be operated above some minimum scale of production.

As seen in Tables 11.4 - 11.6, a selected group of mining and manufacturing industries have been checked and diagnosed according to the standard industrial classification. Of the industries thus screened, the food processing, alcogas and ceramic industries seem to be the most promising for Bohol because they could be innovative in technological development medium-scale, and high in productivity.

Table 11.4 DEVELOPMENT POTENTIALS OF MINING AND MANUFACTURING IN BOHOL (1)

Industry Group* / Items for Evaluation	2231 Limestone Quarrying	2234 Silica Sand Quarrying 2234 Clay	22913 Guano Gathering
1. Forward/Backward Linkages	363 Manufacture of cement 371 Iron basic industries	361 Manufacture of pottery, etc. 369 Manufacture of structural products	11 Agricultural crop production
2. Labor/Capital Intensity	Capital intensive Estimated sales volume - ₱4,000,000/capita yr.	Small scale but labor intensive	Utilization of farm labor; Labor intensive
3. Production Scale	National level	Local	Individual
4. Market	Shipped to Mindanao; Some exportation	Out-of-province market	Locally consumed
5. Diagnosis	Steady growth anticipated and well established backward linkages	Due care for environmental conservation is needed for quarrying	Deposit is dispersed throughout the island
6. Prognosis	Linkage with cement industry (363) should be considered	Development will be activated with strengthened backward linkages	Mechanization not recommened

*1977 Philippine Standard Industrial Classification
1978 NEDA

Table 11.5 DEVELOPMENT POTENTIALS OF MINING & MANUFACTURING IN BOHOL (2)

Industry Group* / Items for Evaluation	3115 Canning, Preserving and Processing of Fish, Seafood, etc.	31172 Manufacture of Refined Coconut Oil	31180 Rice and Corn Milling	322 Manufacture of Wearing Apparel
1. Forward/Backward Linkages	1412 Commercial fishing 14901 Seaweed gathering	31160 Manuf. of coco-cake, meal 3129 Food manufacturing	31291 Manuf. of starch and its products	3211 Spinning, weaving, texturizing and finishing textiles 3213 Manuf. of made-up textile goods 3214 Manuf. of carpets and rugs
2. Labor/Capital Intensity	Medium capital required			
3. Production Scale	Small	Proposed production scale of 5,000 t/yr (FMS)	Small to medium scale	Small scale (sub contract basis)
4. Market	Domestic & export markets	Domestic consumption	Domestic consumption	Export to Metro Cebu
5. Diagnosis	Expansion of capital investment recommended	Establishment of plant to supply edible oil domestically, recommended		Fostering the skilled technical labor needed
6. Prognosis	Production of agar-agar or jelly promising			Close contact with trade-tech. recommended

* 1977 Philippine Standard Industrial Classification
1978 NEDA

Table 11.6 DEVELOPMENT POTENTIALS OF MINING AND MANUFACTURING IN BOHOL (3)

Industry Group* / Items for Evaluation	332 Manuf. and Repair of Furniture	35114 Manufacture of Industrial Alcohols	361 Manuf. of Pottery 369 Manuf. of Structural Clay and Concrete Products
1. Forward/Backward Linkage	1189 Fiber crop production 15902 Gathering of uncultivated forest products	11351 Cassava production 31291 Manuf. of starch and its products	2235 Clay quarrying
2. Labor/Capital Intensity	Labor intensive	Capital intensive	Labor intensive
3. Production Scale	Max. 200 employees (on sub-contract basis) 1-2 pieces/day per person	1000-5000 Kl/yr should be increased to the 20,000 Kl/yr level	5,000-7,000 piece/firing
4. Market	Metro Cebu, Metro Manila	Domestic (within the island) consumption	Domestic (within the island)
5. Diagnosis	Hard to mechanize	--	Competitive with mechanization
6. Prognosis	Design and quality control needed	Promising as industrial raw materials as well as gasoline substitute	High-grade refractory could be exported

11.3.2 Development Potential of Small-Scale Industries

The industries selected as feasible with high potential to raise productivity are shown below together with their problem areas and measures for development:

1. Ceramic Industries

Commercial pottery establishments of all sizes are found throughout the island. They are classified into two categories according to their products: those firing brick with furnaces and those molding hollow blocks from sand, gravel and cement.

Resources: major ceramic materials; white clay, feldspar and silica are available within the island

: although of local level, skills necessary for preparing ceramic materials, molding and firing are well established.

: a substantial amount of technical know-how is supposed to be already accumulated.

Constraints: the technology used is of primitive nature (firing temperature; fuel)

: irregular production due to lack of awareness of the market.

In order to develop ceramic industries, a two-phase development plan will be necessary.

Phase 1: technical assistance through expert consultancy services

: rendering of necessary equipment such as zegel cones, pyrometer, grinding machines, and sieves.

Phase 2: establishment of a pilot plant for bricks and tiles

: providing some form of extension services from the Ceramic Training Center of Danao (Cebu)

: raising the productivity of each pottery establishment.

2. Manufacturing of Furniture and Wood Products

Resources: natural materials like "buri" and "rattan" have been used so far, but they are on the verge of depletion.

: indigeneous craft-techniques which are considered as technical skills.

Constraints: most of the workers are employed on a part-time basis with unstable labor demand.

: the importance of market trend and design of pottery is not well recognized.

Prospective ways of development are:

- To organize and integrate small productions units into larger ones.

- Design improvement linked with export market surveys.

11.3.3 Development Potential of Large Manufacturing Establishments

The potential for the development of large manufacturing establishments should be viewed in three respects: institutional infrastructure, physical infrastructure, and industries based on Bohol's resources.

1. Provision of Institutional Infrastructure

Necessity is felt for the creation of a public corporation which will coordinate and promote the establishment of medium scale industries.

The proposed corporation will be a single body organization specifically engaged in:

- the promotion of new establishments to be located in the Bohol Province

- the provision of financial assistance through arrangements with the Development Bank of Philippines

- the provision and management of the planned industrial estate.

2. Provision of Physical Infrastructure

(a) Provision of basic physical infrastructure which is lacking in the province will encourage large manufacturing establishments.

(b) The estate will consist of suitably sized lots, utility facilities, service roads and waste treatment facilities.

(c) The proposed public corporation will be engaged in the acquisition of land and in the construction and provision of the industrial estate.

3. Potential for Establishing Bohol's Resource Based Industies

Top priority should be given to industries which make most use of the agriculture/fishery products as input materials.

The industry types suitable for large production have been considered, and the possible input-processing-output relationships are shown in Table 11.7 below:

Table 11.7 Input-Processing-Output Relationships

Input	Potential Industries*	Output
Seaweed, Fish	3115 Canning, preserving and processing of fish, seafood, etc.	Agar-agar (additive for food, ingredients for cosmetics), Canned fish, Sausage
Coconut	31172 Manuf. of refined coco-oil	Edible grade coco-oil
Corn, Cassava	31291 Manuf. of starch and its products	Starch, intermediate input for pharmaceutical products
Cassava	35114 Manuf. of industrial alcohol	Alcohol, Glycerine, Detergents

* Numbers preceding the item show "Philippine Standard Industrial Classification"

11.4 Objectives and Targets

The overall goal of mining and manufacturing is to increase net domestic production, thus contributing to the regional economic growth. This means that the target shares of production of manufacturing should be set at 15% and 22% and those of mining at 0.1% and 0.1% by the year 1990 and 2000 respectively. As for the target values, please refer to Chapter 6. The target figures in each of the planning period are set as follows:

11.4.1 Short Term (1980 - 1985)

The industry sector must achieve a high growth rate of production. The target growth rate of 5.9% per annum should be realized through the increase of 1.8% growth rate in productivity and growth in employment of 4.0% per annum.

The target of net production of manufacturing by CY 1985 is 96,650 thousand pesos, or 12.9% of total net production in Bohol, and that of mining is 700 thousand pesos, or 0.1% of total net production. In addition, it should be realized that there will be an increase in production of manufacturing industry amounting to ₱22.7 million over the years 1980 - 1985 period.

For this purpose the core for industrial complex should be established to stimulate the synergetic effect which could be brought about

by concentrated location of establishments. The implementation of package projects calling for an increase in the productivity of small scale industries must be considered.

Mining industry may make a modest contribution to the economy because of the estimated low level of increase in productivity (1.7% per annum) and of the relatively slow increase (3.1% per annum in employment.

11.4.2 Medium Term (1985 - 1990)

The industry sector should grow at an annual compound rate of 8.9%. The target growth rate will be effected through 2.5% per annum increase in productivity and 6.2% per annum increase in employment. By the CY 1990, the share of production by industry sector may grow to 17.1% while that of the CY 1985 will be 14.9%.

The target of net production of manufacturing industry in CY 1990 is set at ₱146.67 million, 14.6% of the total net production, and that of mining industry is ₱890,000. In order to achieve the target an increase in production amounting to ₱50.02 million over the period 1985 - 1990 should be realized by manufacturing industry.

The target growth rate of manufacturing is set at a level of 5.5% per annum while that of mining is 3.1% per annum.

These targets will be attained through the accelerated growth of industries benefited from accumulated capital and from increased return on sales. However, the resulting share of production by mining will be quite nominal in this period.

11.4.3 Long Term (1990 - 2000)

The target of net production of manufacturing industry in CY 2000 is set at ₱515.79 million, 21.7% of the total net production, and that of mining is ₱1.59 million, 0.1% of the total net production. In order to attain this target, an increase in production of ₱369.12 million over the period 1990 - 2000 should be realized by manufacturing industry.

The target share of production of the secondary industry sector is assumed at a level of 25.5% in CY 1990. Out of this 25.5%, 21.7% is the target share of manufacturing industry. The share of mining industry will remain as low as 0.1%.

11.5 Development Strategies

The development strategies for mining and manufacturing should be formulated by taking into consideration the following factors:

(a) A new type of establishment should be introduced into the island with an aim to catalyze and stimulate the

formation of cores for an industrial complex. The scale of the establishments should be medium-scale and the raw materials for production be agro-based so that these will trigger off the formation of forward and backward industrial linkages and benefits of scale of economy. This strategy should be emphasized in the early stage of the development plan.

(b) The measures should be taken immediately to promote and guide the new entry of establishments, either of local entrepreneurs or of out-of-province investers. One of the steps will be to provide suitable infrastructure for them. This will include the provision of public utilities on subsidized base, the leasing of lots, and the improvement of access roads.

(c) The growth of the secondary industry will be facilitated by the effect of densely concentrated industrial location. The concentrated rather than dispersed location will also facilitate the accelerated growth and the efficient distribution and delivery of industrial commodities.

(d) In the long run, increase in the per hectare yield of crops and fish catches will necessitate the processing of those primary products into value-added products. This strategy is desirable not only for the purpose of development of agro-fishery processing industry but also for the creation of employment opportunities.

(e) The introduction of mechanization into indigenous small-scale industries will not only raise the productivity, but will help small-scale entrepreneurs develop awareness of need for regular production and planned shipments. The productivity promotion package will include: the use of electricity as a component of mechanization, workshops on the quality, design improvement of goods, and technical training to upgrade labor skills, etc.

The appropriate mix of the strategies mentioned above at each state of the development plan will be able to bring about the most fruitful results.

11.6 Formulation of Development Program for Manufacturing Industry

11.6.1 Goals

The ultimate goal for the development of mining and manufacturing is to increase the domestic production of both sectors.

In order to attain the overall goal, the following sub-goals are identified for their development programs/projects:

- To provide basic infrastructure for industrial activities.

- To contribute to an increase in export earnings, especially of the labor intensive industries.

- To increase the productivity of mining and manufacturing industries.

The first sub-goal aims at raising productivity of industry in high-potential development areas.

The second sub-goal aims at improving both the quality and design of products of labor intensive industries, particularly of small-scale cottage industries.

The third sub-goal aims at modernization and introduction of mechanization into small-scale industries.

11.6.2 Program Description

1. Tagbilaran Industrial Estate Development Program (TIEDP)

1) Program Description for TIEDP

The program is to establish an industrial nucleus for the manufacturing industries so as to accelerate the concentric growth of industrial activities in the Tagbilaran-Tubigon belt area. One of the sub-goals of the program is to create employment opportunities for 750 persons and to have shipments of ₱150 million by CY 1990.

The TIEDP will consis of;

- A project to establish physical infrastructure for an industrial estate

- A project to establish an alcogas plant and to promote alcogas-based manufacturing.

The first project will include the provision of;

- Supply of water and power from the commonly owned and operated facilities.

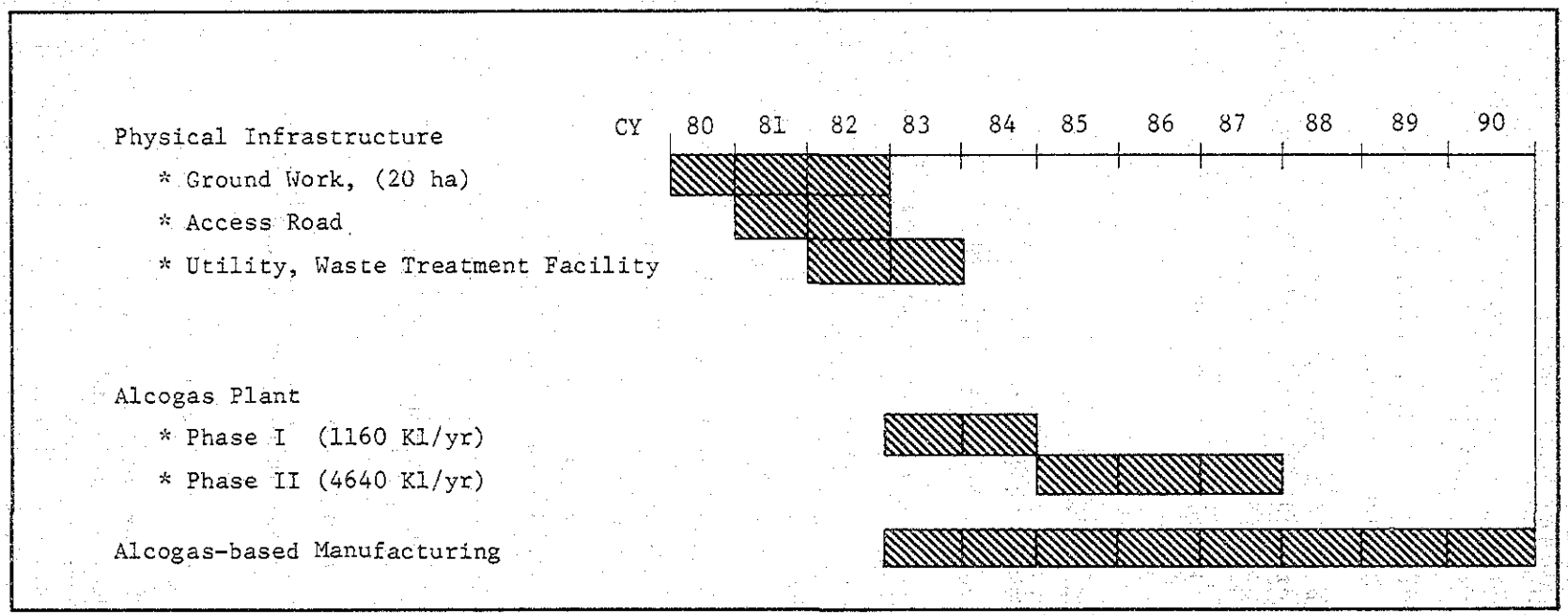
- Factory lots

- Access roads from national/provincial roads to each factory lot.

- Industrial waste treatment facilities.

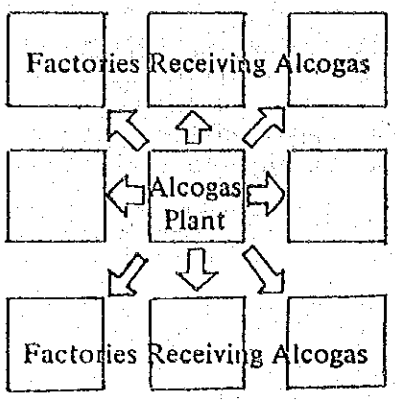
The core of the second project, namely alcogas refinery project is explained in section 15.8.3. The development of energy-intensive manufacturing utilizing alcohol either as a source of energy or as an input material for further processing should be encouraged. The technology development center which

Fig. 11.4 IMPLEMENTATION PLAN OF TAGBILARAN INDUSTRIAL ESTATE DEVELOPMENT PROGRAM (TIEDP)



will be engaged in the R&D of alcogas production and utilization will be built ancillary to the refinery plant.

Shown below is the schematic presentation of this concept.



The proposed establishments to be located include coconut oil mill, ceramic manufacturers, machine-shop factories and seaweed processing factories which are relatively energy-intensive and rely upon locally produced sources of energy.

2) Requirement and Specifications

It is proposed that the projected area will cover 20 hectares, of which 5 hectares will be reserved for the alcogas refinery plant, utility, stock tanks and waste water treatment facilities. Water will be pumped from a deep well, desalinated, and then distributed to each consumer. The estate should be located in the Tagbilaran-Tubigon belt or, more specifically, in the city of Tagbilaran.

3) Implementation Plan

The total program schedule should be formulated by taking account of timing of the alcogas plant construction. The implementation plan is shown in Figure 11.4.

4) Expected Effects

Expected shipment will amount to ₱150,000,000 by 1990.

Expected number of employment will be 750 persons by 1990.

2. Food Industrial Complex Project

1) Introduction

Of industry types thus far screened as the most feasible (refer to section 11.3.1), the possibility of the establishment of a consolidated food industrial complex should be considered.

The rationale for the development of the integrated and well linked groups of industries are:

- Easier access to the warehouses using service roads directly connected to the provincial roads. This facilitates the collection of raw materials and delivery of products.

- Availability of utilities; water and power could be supplied from the estate utility center.

- Employment opportunities. Short commuting time and distance make it easy to recruit potential employees.

- Direct loading for exportation. Surplus products of domestic consumption could be shipped from the port of Tagbilaran.

2) Description of Project

(a) Objective

The objective is to contribute to the self-sustaining supply of coconut oil for domestic consumption of the Bohol province, which is presently imported from other provinces. Saving of the two-way shipment costs between Bohol and the out-of-island plant justifies the establishment of a coconut mill in Bohol.

(b) Process Description

A proposed coconut oil mill is with a production capacity of 5,000 t/year (FMS grade). The raw material is dried copra collected throughout the province of Bohol.

The oil extraction and refining process is as follows: raw material copra is preheated in the drier prior to crushing (moisture less than 10 wt. %), then fed into the crusher. The crushed particles are fed into the preheater where the copra is heated so as to be able to yield maximum oil extraction. The hot copra fines are charged into a screw press where the liquid part is separated from the solid copra meal, and the oil content of the residue is reduced to less than 10%. The liquid part is then fed into a filter press to remove fine solids and the filtrate is stored in a crude coconut oil tank. The refining process includes washing with caustics to remove free fatty acids and stripping with steam. The product is shipped either in bulk drum of 55 gallons or in cans (3.6 liters or 19 liters). The copra meal is packed in jute sacks of 60 kg.

(c) Project I/O Requirements

Input:	FMS grade Copra	5,000 t/yr
Output:	Coco-oil (edible grade)	3,100 t/yr
	Copra meal	1,600 t/yr

Manpower Requirements:

Supervisory Staff:	5
Technical Staff:	5
Laborers:	45

Equipment:

Crusher, heater, expeller, filter press, steam stripper and storage tank.

(d) Location Recommendation

The location of coconut oil mill plant should be determined by considering the following conditions:

- Physical distribution of raw materials and products: coconut is grown extensively along the northwest coastline, i.e., Inabanga, Clarin, Tubigon, Calape, Loon and southwest to south coastline of Candijay, Anda, Guindulman and Valencia. Dried copra collected locally from barangay producers is transported to municipal depot, then to the oil mill via the Provincial Road. Hence, this plant should be located along the provincial road so that the collection of raw materials and delivery for domestic consumption be easily and smoothly conducted. To minimize the transportation cost, the plant should be located as near as possible to the center of densely inhabited areas.

- Utility: the availability of water and power is vital for the location of the mill. At present a substantial part of the Bohol province is being electrified. Power should be received from the grid. The plant should be located along Route 4 or Route 1 and preferably in the City of Tabgilaran or in its vicinity.

3. The Production Promotion Package for Small-Scale Industries

The following package program consists of a set of projects which are immediately to be implemented and the expected outcomes are easy to be obtained. Some of the projects from this package are sorted out as high impact projects. The package program includes:

(a) New technology development project -- introduction of modern technology into the relatively developed local processing systems through technical assistance and through sending experts and holding workshops on management for entrepreneurs.

(b) Skill training project -- skill training which puts emphasis on the trainees' acquisition of a commercial sense for the design of products.

(c) Project to secure raw materials for cottage industries -- measures to secure the self-supply of raw materials used for cottage industries which have so far been in short supply; most urgent materials to be secured are "buri" and "rattan."

11.4.7 High Impact Projects of Manufacturing Industry

Of the programs/projects identified for the mining and manufacturing development plan, new technology development project of the "Production Promotion Package for small-scale industries" has been singled out.

This project should be implemented immediately in order to raise the productivity of the small-scale industries.

Project Title: New technology development for small-scale industries.

1. Introduction

The success of the small-scale industry development largely depends on how much productivity can be raised. The emphasis should be put on the types of industries which were diagnosed in sec. 11.3.2 to have potentialities for further technical breakthrough.

2. Project Description

1) Objectives

The objectives are:

- to make entrepreneurs aware of the modern technology, including mechanization and planned production.

- to demostrate superior technical level and quality of products with improved skills/technology and optimal use of materials.

2) Targets

Technical development is required in ceramic industry, manufacture of wearing apparel, and manufacturing of metal products.

- to hold workshops with a total annual enrollment of more than 500 persons with practice and exercise sessions.

- to provide expert consultancy services for more than three types of industry with 60-80 man days for each.

- to provide necessary machinery, equipment and tools whenever it is felt vital for modernization.

3) Implementation Plan

- executing agencies: NACIAD will be the main working agency coordinating the activities of NSDB and other related agencies.

- implementation schedule: all the project activities should ne conducted within the two years period 1980 - 1981.

- estimated cost: ₱500,000.

Footnotes

1) Grant W. Corby etal, Geology and Oil possibilities of the Philippines, Technical Bulletine No. 21, Republic of the Philippines Dept. of Agriculture and Natural Resources.

2) Jose S. Portacio, Jr. "Notes on hydrothermal alteration in Philippine prophyry copper deposits", Mineral Engineering Magazine, April-June, 1975.

CHAPTER 12
TOURISM DEVELOPMENT PROGRAMS AND PROJECTS

CHAPTER 12 TOURISM DEVELOPMENT PROGRAMS AND PROJECTS

12.1 Tourism Development Plan

12.1.1 General Background for Tourism in Bohol

Bohol is an island filled with many potential tourism resources: unspoiled beaches, mildly undulating interior plains, and colorful cultural/traditional/historical heritages. All these resources indicate the resources to create a major tourist center. However, presently the tourism industry of Bohol is still in the pre-take-off stage of development, even though the available statistical data indicates a galloping growth rate in tourist volume. The tourism industry has not yet accumulated necessary and sufficient tourist facilities, manpower, and financial resources. What makes this situation even worse is the lack of institutional framework and the lack of the supportive infrastructures.

This chapter seeks develop alternative plans to develop the tourism industry to be a major economic sector on a long term basis. For the short term development, high impact projects will be identified which can exert the initial momentum to the development.

12.1.2 Analysis of Current Tourism Problems and Trends

Although the growth rate of tourist volume in Bohol has been remarkably high, averaging 46.7% per annum in the 1973-77 period, the relative scale of tourist volume is a small one: approximately 4-5% of the annual tourist volume which was received by Region VII (See App. 12.1). International tourists constitutes approximately 20% of the tourist volume; domestic tourists constitute 80% of the tourist volume (See App. 12.2). The percentage figure of international tourist volume, 20%, is almost one half of the Region VII international tourist volume, which amounts to approximately 37% of the total tourist volume.

In the same period, 1973-77, the distribution of domestic tourist origions was 33.8% from Mindanao, 18.1% from Cebu, and 28.9% from Manila (See App. 12.3). These findings indicate that the tourist market is presently oriented to domestic tourists, and most probably the majority of the domestic tourists come for business or to visit relatives.

The tourist receipt of Bohol is assumed to be small because of three factors: small tourist volume, short length of stay and low expenditures. These factors are indicative of the real problems which hamper further development of tourism in Bohol.

The underlying factors causing problems for the tourist industry are analyzed in the paragraphs which follow (see App. 12.7).

1. Lack of Cohesive Tourist Image

The tourist image of a destination of utmost importance and necessity in tourism development since prospective tourists tend to select their destination not by objective assessment, but by the image projected to them.

In this respect, the tourist image of Bohol appeares to be a divergent mixture lacking a cohesive focus. This is partly because of the scattered variety of tourism resources of Bohol which tends to dilute an image, but mainly because of the insufficient marketing efforts to find, establish, and propagate an image to appeal to a single or multiple tourist market segments.

2. Lack of Market Analysis

Presently no methodological market analysis is possible due to the insufficiency of macro and micro tourism data such as:

Macro-data

- Tourist Receipt
- Tourist Volume
- Length of Stay
- Expenditure

Micro-data

- Originating Country or Region
- Socio-economic status of tourist
- Motivations
- Type of travel, etc.

Without such data it is extremely difficult to identify existing tourist flows and corresponding tourist products. This data collection efforts should not be limited to Bohol, but should be extended to the whole Region VII, other regions, and other tourist originating countries.

3. Ambiguous Governmental Authority

To achieve coordinated and well-balanced tourism development, the governmental authority has an important role as follows:

- to set forth development policy
- to formulate, implement, control, and supervise the development
- to request budgetary allocation for tourism development
- to draft the necessary laws, acts, ordinances, and regulations pertinent to tourism development, and to enforce these legal measures.

This aspect is also very weak. A field office of the Ministry of Tourism does not yet exist and the Provincial Trade and Tourism committee is still ambiguous as to the enforcement of the aforementioned criteria.

4. Undeveloped Tourism Industry

The tourism industry of Bohol is very small and lacks the inter-sectoral linkage. Generally hoteliers act a major role in the tourism development; however, in Bohol's case, most of the hotel accommodations are concentrated in Tagbilaran with only one exception of a hostel at Chocolate Hills in Buenos Aires near Carmen. These hotels are generally aimed at the business tourist market; very few are up to international standards to accommodate international tourists as well as long term domestic tourists. Similarly the catering services are located within the hotel boundaries; therefore, few quality restaurants are found even in the Tagbilaran area.

Tour operators such as air-carriers, ferry operators, travel agents, and tour car/bus operators are inactive. Especially travel agents with a capability to attract group tours are absent in Bohol due largely to the lack of hotel accommodations; similarly, no regularly scheduled bus tours are present which is another shortcoming.

Finally one of the strongest magnets for tourists, but not yet fully exploited is the cottage industry of Bohol. Currently the cottage industry here does not seem serious enough to look at the market of incoming international and domestic tourists since most of the products are made for the dealers in Cebu and no direct input of the market requirements are well-known to cottage industry operators.

5. Lack of Technical and Social Infrastructures

The supportive technical and social infrastructures are also lacking. Since areas for resort development are generally secluded, providing such infrastructures is a crucial element for the feasibility of their development. Among many important infrastructures, the following are critical infrastructures which are lacking in the potential areas for development:

Technical Infrastructures

- Fresh water supply
- Electricity
- Telecommunications
- Sanitary sewage and treatment plan
- Garbage disposal
- Airport/ports/roadways

Social Infrastructures

- Public Health
- Hospitals
- Educational Facilities

12.1.3 Tourism Potentials vs. Constraints

1. Tourism Resources (See App. 12.4 and App. 12.8)

Bohol has abundant tourism resources: from a peculiar view of the Chocolate Hills to the historical Blood Compact site, the Phillipines' oldest church at Baclayon, the smallest monkeys (Tarsius), white sand beaches, springs, caves, camp sites, etc. (See App. 12.4). However, without extensive improvements in such resources most of the tourist spots are not attractive and unique enough to induce international tourists domestic tourists to visit Bohol. On the other hand, those which require no additional improvements as far as the quality is concerned are generally located at remote locations such as Chololate Hills, Doljo Beach in Panglao and other remote islands as Balicasag Island, Pamilacan Island and Cabilao Island. In this case, access is a critical constraint to attract tourists.

2. Manpower Resources

Although few managerial and technical personnel are readily a available for the operation and management of the tourism industry, Bohol has sufficient teaching staff and educational facilities to service the manpower needs for the industry in a rather short period of time, and a sufficient young labor force exists in Bohol.

3. Financial Resources

Both the public sector and the private sector are inactive on investment to the industry and the necessary supportive infrastructures. In this aspect, exogenous investments from the national government and private investors outside of Bohol are deemed necessary to initiate the tourism development of Bohol.

4. Institutional Resources

The Bohol Provincial Trade and Tourism Committee was founded in 1977; however, the committee has not been authorized to exercise such important and necessary powers as planning, implementation, controlling, supervision, coordination of inter-governmental agencies, and budgetary requests for the tourist development. This is also a constraint to the tourism development.

5. Tourism Industry Resource Inventory

Although the tourism industry is small and not cohesive, it does possess some assets for future developments.

1) Hotels

- 6 Hotels with 88-Room capacity in Tagbilaran
- 1 Hotel with 8-Room capacity in Chocolate Hills near Carmen

2) Catering Facilities

- 4 relatively fair quality restaurants in Tagbilaran
- 1 restaurant in Chocolate Hills near Carmen

3) Transportation Access

Air Transport

Cebu - Tagbilaran (4 flights per week; 35-minute trip)

Sea Transport

Cebu - Tagbilaran (1 trip per day; 3.5 hour trip)
Cebu - Tubigon (4 trips per day; 2-2.5 hour trip)
Mindanao - Jagna (1 trip per day)

Land Transport

2 Tour Buses (25 seater each) in Tagbilaran (the services are limited to the hotel patrons.)

Tubigon - Clarin - Sagbayan - Carmen - Buenos Aires (Chocolate Hills)
(3-hour trip by local buses with a transfer at Carmen)

Tagbilaran - Loay - Bilar - Buenos Aires (Chocolate Hills)
(3-hour trip by local buses without transfer)

12.1.4 Tourism Objectives and Target Variables

Considering the analysis of existing overall resources and constraints for tourism development, the objectives and target variables were set forth for the Short Term (1980-85), the Medium Term (1985-90), and the Long Term (1990-2000). Due to the serious lack of data, the target values such as traffic volume, length of stay, and ratio of international tourists to domestic tourists are to be set as goals instead of projected values.

1. Short Term (1980-85)

Objectives:

- To establish and promote one or two unique and attractive tourist images for Bohol.
- To create and/or reinforce tourism policy making, implementation, and monitoring organizations.
- To increase the tourist receipt to give an initial development thrust to the tourism industry.
- To provide the minimum technical and social infrastructures for the primary development areas.
- To provide the minimum hotel accommodations and catering facilities by International standards.

- To provide the minimum required Manpower for operation of the tourism industry.
- To provide the minimum transportation system to secure easy access to tourist spots.

Target Variables:

- Tourist Volume

Year	Target Tourist Volume	Growth Rate Per Annum
1980	8,070	13.9%
1985	15,500	

- Length of stay by 1985:

I) Domestic Tourist = 2.0 days
II) International Tourist = 2.5 days

- The ratio of the International tourists to the Domestic tourists by 1985:

International Tourists: Domestic Tourists = 30:70

2. Medium Term (1985-90)

Objectives:

- To increase the tourist receipt to afford the tourism industry continuous self-expansion.
- To provide the technical and social infrastructures for the secondary development areas.
- To provide international standard hotel accommodations and catering facilities in accordance with tourist demands.
- To provide the required Manpower for the operation of the tourism industry.
- To expand and upgrade the transportation system to connect most of the tourist spots.

Target Variables:

- Tourist Volume:

Year	Target Tourist Volume	Growth Rate Per Annum
1985	15,500	15.5%
1990	31,900	

- Length of stay by 1990:

I) Domestic tourist = 2.5 days
II) International Tourist = 3.5 days

- The ratio of the International tourists to the Domestic tourists by 1990:

International Tourists: Domestic Tourists = 35:65

3. Long Term (1990-2000)

Objectives:

- To establish the tourism industry as a major income generating industry for Bohol.
- To diversify the tourist images of Bohol to flexibly correspond with various tourist needs in time and space.
- To preserve natural, cultural, historical, and traditional heritages for the future generations of Bohol and the Philippines.
- To shift the emphasis from international tourism to domestic tourism.

Target Variables:

- Tourist Volume:

Year	Target Tourist Volume	Growth Rate Per Annum
1990	31,900	12.0%
2000	99,100	

- Length of stay by the year 2000:

I) Domestic Tourist = 3.0 days
II) International Tourist = 4.5 days

- The ratio of the International tourists to the Domestic tourists by 2000:

International Tourists: Domestic Tourists = 30:70

12.1.5 Tourism Development Strategies

1. Alternatives

Tourism development in Bohol has many alternative choices such as the following:

- whether to develop Bohol as supplementary and/or complementary to the regional growth center, Cebu, or to develop itself towards an independent tourist attraction of the Region VII.
- whether International tourism or Domestic tourism should be emphasized.
- which tourist products are to be marketed - Sea Resort, Mountain Resort, Sightseeing, etc. An outline of the different possibilities and their implications is shown in App. 12.9.

2. Selection of Development Course

1) Intra-regional Linkage

It is essential to consider the intra-regional linkage of the tourism development. Presently Cebu, a regional growth pole, has an international airport and major ports; as a matter of fact, the majority of international and domestic tourists come to Bohol by way of Cebu in either case, by air or sea.

The capability to control the entry point is a stronghold of Cebu; therefore, it is logical to conclude that Bohol should be developed as supplementary and complementary to Cebu's tourism development and to avoid creating competion on some tourist products. Tubigon and Tagbilaran will become more and more important to connect the tourist flows to Bohol from Cebu. However, in the more distant future, Jagna and Ubay will also become important entry points of tourists from other regions such as Mindanao and Leyte, respectively.

2) Growth Centers

The tourist spots of Bohol are generally located along the following routes:

- Tagbilaran - Baclayon - Loay - Loboc - Bilar - Carmen
- Tagbilaran - Malibojoc - Calape - Tubigon
- Tagbilaran - Loay - Valencia - Garcia Hernandez - Jagna
- Tagbilaran - Dauis - Panglao
- Tubigon - Clarin - Sagbayan - Carmen

Among the above city and municipalities, Tagbilaran, Tubigon, Carmen and Jagna would become crucial growth centers for the tourism development.

3) Type of Tourism

With the very limited data on the characteristics of tourism, it is extremely difficult to select which type of tourism should be given priority for development. Choices are either International Tourism or Domestic Tourism. In selecting the type of tourism for Bohol, Business tourism cannot be considered as priority, since the need for this particular type of tourism will arise only in correspondence with the increase in business activities. Nevertheless, the existing local hotel accommodations especially in Tagbilaran are expected to be patronized by business tourists. Even though, further development of the business tourism is expected, a market of this type generally does not respond to the investment outlays, as do International tourism and Domestic tourism.

For the initial development, international tourism development will have a very significant impact on the provincial

economy in order to develop the minimum standards in all the sectors and sub-sectors related directly or indirectly to the tourism industry.

On the other hand, the inducement of international tourism should remain as an initial prime mover at the beginning only and should shift toward heavier emphasis on domestic tourism in the distant future. The transition from international to domestic tourism will be in accordance with the rate of growth of Filipinos recreation and leisure.

4) Tourist Resources

In relation to the selection of tourism, types of tourist resources should be determined. Accordingly, for the initial stage, the tourist products not requiring further improvement which may attract international tourists are:

- One or two-day sightseeing tours to visit the Blood Compact Site, Baclayon Church, Chocolate Hills, Calape Church, Punta Cruz, etc.
- Relaxing sea resort - Doljo Beach, Alona Beach, and Bikini Beach in Panglao.
- Active sea resort - scuba diving/fishing in such remote islands as Cabilao Island (10 km. west of Calape), Balicasag Island (10 km south-west of Panglao) and Pamilacan Island (12.5 km south of Baclayon).

In the more distant future, tourist products for international as well as domestic tourist should be expanded to include more archaeological, cultural, and educational features in addition to more recreational features.

3. Implementation Strategy for Short, Medium and Long Term Development

1) Short Term Development (1980-85)

In this phase, all development efforts should be geared toward establishing a small but complete program to attract more international tourists, especially of package tour form, as an initial boost to the tourism industry in Bohol. To achieve these goal, tasks necessary for the development of tourism should include the following:

1. To reinforce the existing institutional framework such as Provincial Trade and Tourism Committee to exercise powers of policy making, planning, implementation, controlling, supervision and coordination of intergovernmental agencies at Provincial level.

2. To generate the data for market analysis - demand and supply analysis which includes the detailed existing tourist flow and its projection, and the inventory of the supply and the projected requirements.

3. To promote a unique and attractive tourist image or images to the international tourists as well as domestic tourists, i.e., the promotional activities be extended to overseas countries packaged with the promotional activities of Region VII.

4. To provide good transportation access including tour buses.

5. To introduce one or two-day sightseeing tours to the tour operators i.e., to attract more tourists visiting Cebu or from the Cebu area.

6. To provide a resort hotel capable of accommodating a package tour group.

7. To provide adequate and sufficient manpower.

8. To concurrently provide and improve the supportive infrastructures.

9. To improve the tourism resources in accordance with the development policy and market trend.

These development procedures are of the minimum requirements to start-up the tourism industry.

2) Medium Term Development (1985-90)

The second phase is to reinforce and expand the successful tourist images and products created in the preceding phase and to diversify them on a rather small scale while monitoring the increase of tourist volume. This phase may be considered as the actual take-off stage of Bohol's tourism development. Up to this point, most of the primary areas - Tagbilaran, Tubigon and Carmen should have begun to sense the arrival of the tourism industry. Next is to expand the trend to such secondary areas as Jagna, Loboc, and Panglao; however, heavier emphasis should still be on the fulfillment of the tourism development in the primary areas. Only the continuous construction and improvement efforts of the technical and supportive infrastructures should be made for the next phase.

3) Long Term Development (1990-2000)

In this phase, some clear cut tourist images should be established and latent demand of tourist market should be exploited. Also, the shift toward domestic tourism from the international tourism is proposed to minimize the profit leakage out of Bohol based on a growth in the affluence of the region and of the nation in general to afford increased expenditure for leisure and recreation. At this stage, the social and environmental damage may become conspicuous and strict laws and their enforcement regarding protection of

natural resources and wild life should be taken into consideration.

12.2 Formulation of Long Term Tourism Development Program

12.2.1 Goals, Sub-goals

1. Goals

The goals for the Bohol tourism development are as follows:

- to make the tourism a major income generating industry while minimizing possible profit leakage out of the province
- to upgrade and/or establish the image of Bohol as an international and domestic tourist spot
- to develop and preserve the natural/cultural/historical tourism resources of Bohol.

2. Sub-goals

On the basis of the aforementioned goals, sub-goals have been established as follows:

- to increase the tourist receipts
- to increase the employment opportunity
- to promote long term local tourism and recreation
- to develop the tourism in an economically, socially, and environmentally balanced manner
- to maintain, improve, and protect the natural/cultural/-historical heritage of Bohol

12.2.2 Program Description

The tourism development program was derived to accomplish the goals and sub-goals set forth in the preceding sub-section. To accomplish these goals and sub-goals on the long-term basis, the tourism development program has six sub-programs and component projects which are as follows:

(a) Institutional Reform Project

(b) Market Survey/Promotion Project

(c) Tourism Industry Development Program

Hotel Development Project

Transportation Development Project

Cottage Industry Development Project (refer to Chapter 11)

(d) Manpower Training Project

(e) Tourism Resources Development Program

Historical Site/Building Improvement Project
Park/Recreational Facility Development Project
Wild-life Preservation/Environmental Protection Project

(f) Supportive Infrastructures Development Program

Airport/Port/Roads Improvement Project
(refer to Chapter 14)
Water Supply/Water Resources Development Project
(refer to Chapter 13)
Electrification Project
(refer to Chapter 15)
Telecommunication Development Project
(refer to Chapter 16)

12.2.3 Conditions and Requirements

1. Coordination

Coordination, among the concerned governmental agencies and economic sectors with precise timing of planning and implementation, is deemed necessary to meet the fundamental conditions and requirements for the execution of the programs and projects for tourism development.

2. Finance

The major investment role will be carried out by the private sector such as hoteliers, tour operators, etc. Moreover, it is necessary for the public sector to offer incentive measures similar to the Investment Incentives under Presidential Decree 535 described in TIPP (The Tourism Investment Priorities Plan).

3. Hotel Industry Investment Schedule

Based on the target values and variables for the short, medium, and long term development, the number of required additional hotel rooms were estimated as follows: (See Table 12.1 and App. 12.5)

Table 12.1 Hotel Industry Investment Schedule

Year	No. of additional hotel rooms required	Investment (₱Millions)
1980	-	-
1985	31	3.1
1990	219	21.9
2000	955	95.5

Fig. 12.1 TOURISM DEVELOPMENT MAP (LONG TERM)

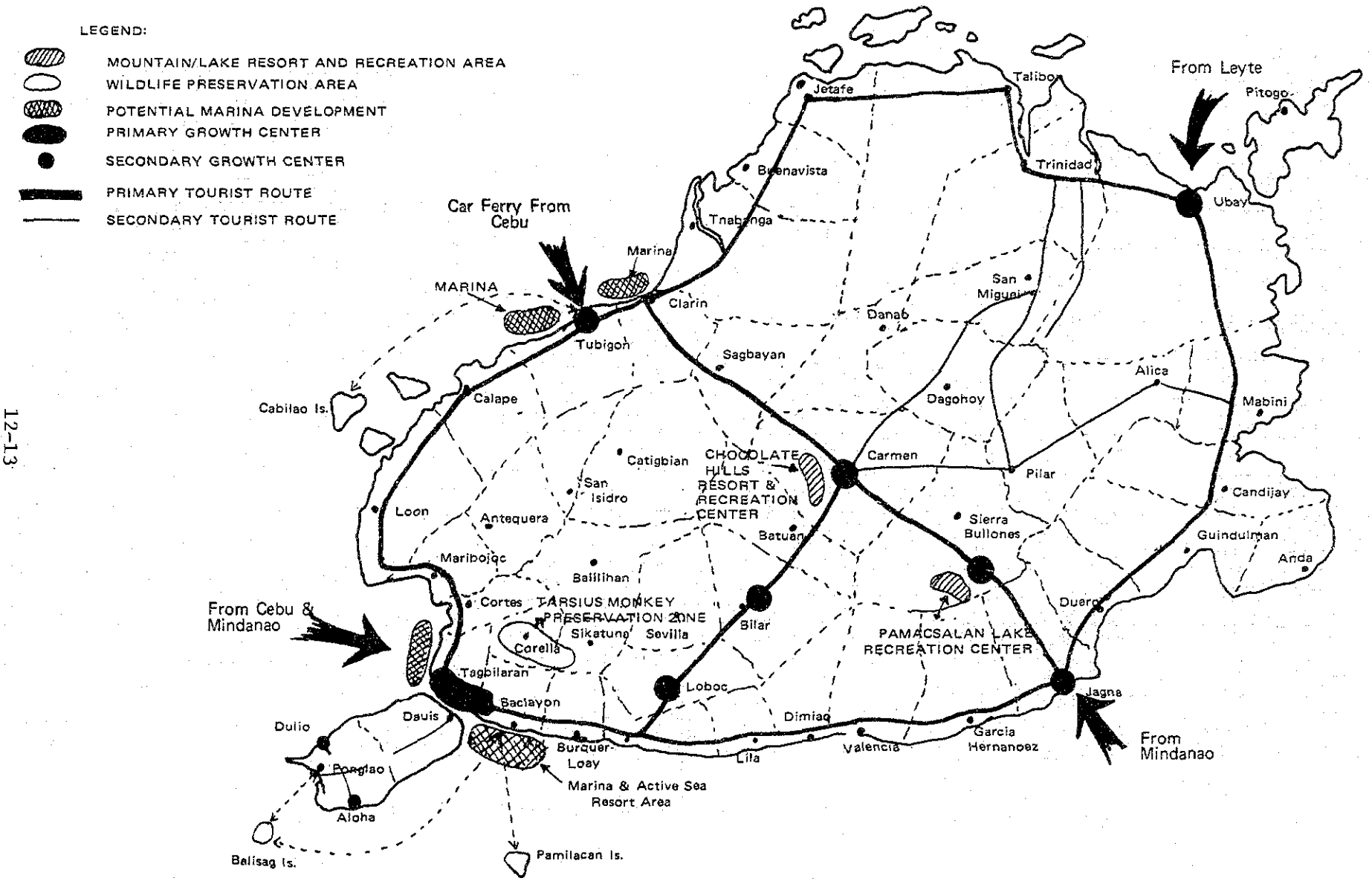
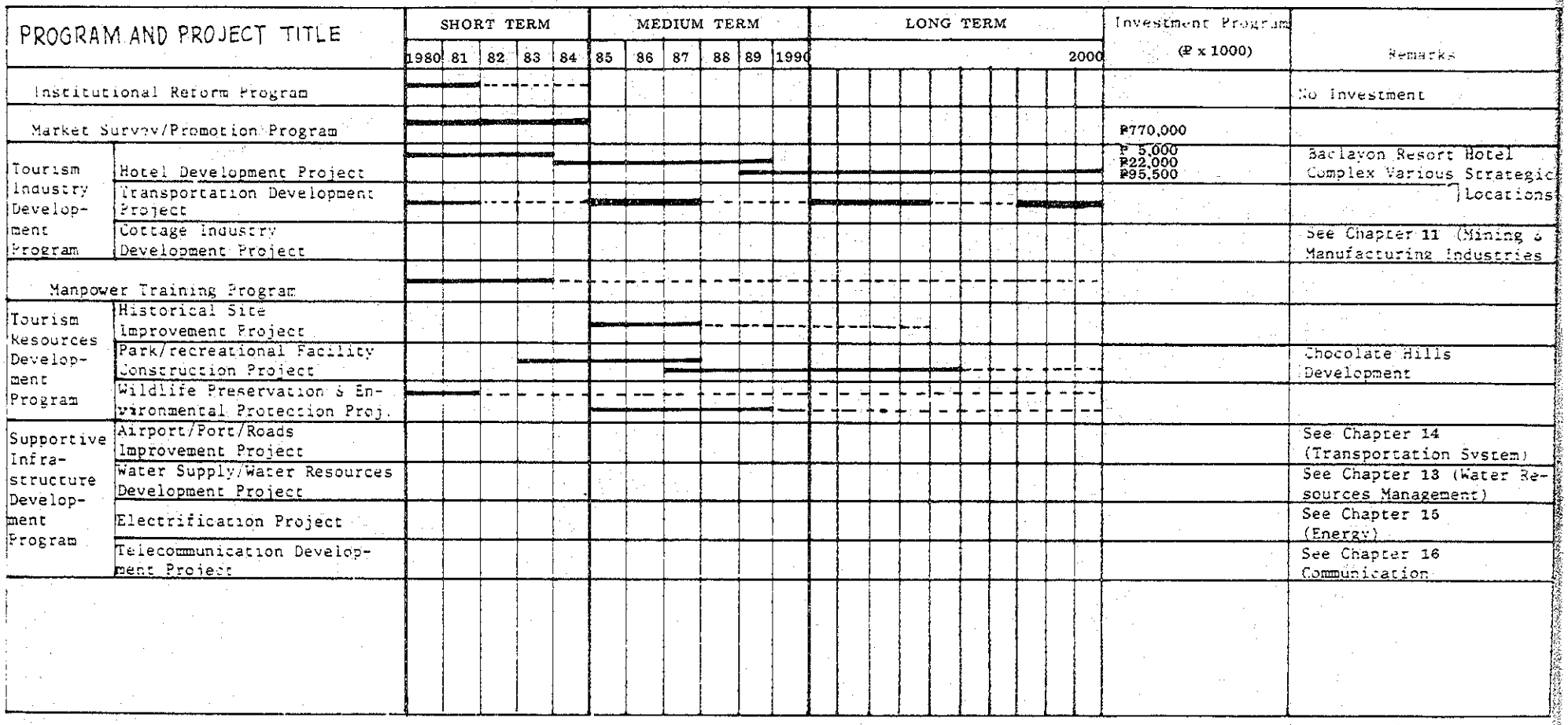


Fig. 12.2 TOURISM DEVELOPMENT IMPLEMENTATION PLAN (1980-2000)



4. Tourism Area and Locations (See App. 12.6 and Fig. 12.1)

5. Implementation Schedule

The total tourism implementation schedule is illustrated in Fig. 12.2.

6. Expected Effects

By the turn of the century, this program, if accomplished as expected, will create approximately 1,500 employment opportunities directly connected to the tourism industry and an additional of 1,500 to 3,000 employment opportunities from multiplier effects. The total number of recipients who will benefit from this, will accumulate up to 15,000-27,000 Boholanos. This increase of employment opportunity should help alleviate the unemployment and underemployment problem of the Province.

With the provincial revenue increase from the tourism industry, Bohol will benefit directly and indirectly. However, it should be noted as economic drawbacks, that the tourism industry is vulnerable to the socio-economic conditions of generation and receiving countries and tends to cause inflationary trends, especially notable in such items as land, consumption goods, etc.

Other effects are the social and environmental degradation. Since these effects are unquantifiable, the extent of these effects is unpredictable. To cope with the development of social and environmental externalities, the utmost care in formulation and planning to counteract the possible occurance of problems are suggested at the earliest possible time of the tourism development.

12.3 High Impact Tourism Project – A: Market Survey/Promotion Project

12.3.1 General Background of the Tourism Market

As repeatedly mentioned in the preceding sections, the success of the tourism development is hinged upon the finding of a tourist market(s) and the promotion of it. Any speculative investments without a proper market analysis could result in a total disaster. Tourism in Bohol cannot afford a costly trial and error search for best suitable market. Thus, this project is a prerequisite for the tourism development of Bohol.

12.3.2 Description/Summary of the Market Survey/Promotion Project

This project is intended to execute the following tasks:

- Data Generation
- Information Service to the tourists
- Promotion

The project is intended to perform the above tasks in a continuous five-year term and be located at the Tagbilaran Airport.

1. Project Description

1) Objectives

- to determine tourist images and products most suitable to the tourism development of Bohol
- to make tourists aware of the tourism resources and conditions in Bohol
- to attract more international tourists as well as domestic tourists

2) Targets

- to generate the necessary and sufficient data on tourists to make a market analysis
- to render information services to tourists at the important entry points to Bohol
- to promote the Bohol tourism in the originating countries and regions

3) Market Policy

- Data generation should cover the tourist receipt, volume, length of stay, expenditure, originating country/region, socio-economic status, motivation, type of travel and should also assess the supply of the tourism industry as to types of hotel, available number of rooms, transportation availability/cost, etc.
- Information service will be given to all tourists and such service will be extended to respond to the tourist's complaints.
- Promotion is aimed at international and long term domestic tourists.

4) Production Policy

- Generated data will be analyzed and published quarterly and yearly.
- Information will be obtained at the airport or through telephone calls.
- A descriptive leaflet of Bohol tourism should be made and distributed to all domestically and internationally strategic point - all primary Airpots, Hotels, Airline Offices, Travel Agents, etc.

5) Required Conditions

Organization

Ministry of Tourism and/or Provincial Trade and Tourism Committee

Cooperation

Cooperation from public bodies and private sector is a pre-requisite. It is especially necessary for the task of data generation since most of the new data may otherwise be be withheld.

Manpower

Minimum of 3 administrative and technical staff members are necessary to manage and operate as follows:

Administrative	1
Statistician	1
Clerk	1
Total	3

6) Areas Recommended (See Fig. 12.3)

Tagbilaran Airport in Tagbilaran is recommended for the following reasons:

- to be close to the air/sea transportation entry points
- to be close to the governmental institutions and the tourism industry
- to utilize the availability of telecommunication system

7) Project Operation and Management

It is suggested that the Ministry of Tourism and Provincial Trade and Tourism Committee initiate the project, however, the actual operation and management at the first phase should be executed by the Ministry of Tourism as a form of Region VII field office extension, and eventually the operation and management is transferred to the Provincial Trade and Tourism Committee.

8) High Impact Tourism Projects Implementation Plan

- Project Schedule (See Fig. 12.4)
- Project Costs (See Table 12.2)

Table 12.2 High Impact Tourism Project Costs

	Initial Investment	Operation/Yr.	5 Yr. Total
Office set-up/operation	₱150,000	₱36,000	₱330,000
Personnel expenses		₱36,000	₱180,000
Promotion leaflets (50,000 leaflets/yr.)	₱10,000	₱50,000	₱260,000
Total	₱160,000	₱122,000	₱770,000

9) Effects

The effects of the project will include:

- Clear understanding of the existing and future tourist flow and tourist characteristics particular to Bohol.
- More confidence of the private sector to invest in the tourism industry due to the accurate assessment of the market.
- Clear tourist images projected to a broad range of prospective tourists.
- Increased awareness of the tourism industry for self-improvement due to the informed tourists.

In short, the project will create bilateral awareness of the tourism industry and tourists.

12.4 High Impact Tourism Project - B: Sea Resort Hotel Development Project

12.4.1 General Background of Hotels

The hotel industry is a core of the tourism industry. Basic accommodation facilities for international tourists and long-term domestic tourists are mostly lacking in Bohol. Although the targeted effective demand for such a resort hotel will not occur prior to the year 1985, it is necessary to provide the facilities at the earliest possible time to induce group tourism into Bohol. This project should serve as a major stimulus to the tourism industry in the area.

12.4.2 Description/Summary of the Sea Resort Hotel Project

A sea resort hotel with a capacity of 50 rooms is proposed to be built on the 5 ha. site located near Baclayon. The exact location must be carefully chosen to avoid interruption of the historical and cultural atmosphere of Baclayon. The proposed project is to be completed, from the inception to the actual operation, in a four-year period, costing approximately five million pesos.

1. Project Description

1) Objectives

- to be a model resort hotel development
- to establish a core for future hotel zone, within the economic domain of Tagbilaran
- to stimulate initiation of improving the tourism resource rich area of Baclayon

2) Targets

- to attract group tourism into Bohol especially International tourists and long term domestic tourists
- to be economically feasible for initial development and operation of the hotel

3) Market Policy

There are two markets available to the proposed development: one is, as previously mentioned, the international and long term domestic group tour market and the other is the local convention market.

4) Production Policy

For the group tour market, the proposed hotel accommodations must have an international three-star quality or better, complete with some outdoor sporting facilities such as swimming pool, tennis courts, etc. In addition, a minimum of 50 twin-bed guest/rooms must be provided to accommodate a tour group.

It is also a necessary policy to provide and/or arrange tour buses for a one to two-day sight-seeing tour, and boats to transport guests to other remote islands such as Pamilacan Island and Balicasag Island.

For the local convention market, a minimum facility to house 200-300 guests is required; catering facilities must be provided accordingly, in addition to the facilities for other ordinary guests.

5) Required Conditions

Organization

The development is expected to be exclusively carried out by private developers. However, extensive gorvenmental assistance for land acquisition, project areas preservation, development incentives, provision of the supportive infrastructures, manpower training is crucial to the success of the project. It is necessary to call on the inter-government coalition of the Ministry of Tourism, Provincial Trade and

Tourism Committee, Provincial Development Council/Staff and other related agencies for providing cohesive planning and implementation of the tourism development.

Site

The development site must be a minimum of 5 ha., within or somewhere near the beach secluded and free from the disruptive surroundings, such as, noises, fumes, polluted water, etc.; however, the site has to be close enough to the primary or secondary access road and to the supportive infrastructures particularly electrical power and fresh water supply.

Manpower

Approximately 50 skilled employees are necessary to manage and operate the hotel.

Supportive Infrastructures

In general, most of the supportive infrastructures are available; only the critical requirement here is the acquisition of fresh water supply. The water consumption of the hotel is estimated to be 40-50 cubic meters per day.

6) Area Recommended (See Fig. 12.3)

Baclayon or the vicinity of Baclayon is recommended; however, if a site elsewhere is suggested, the alternative site should satisfy the following criteria:

- to have the existing natural/man-made resources which are flexible enough to diversify tourists attractions for the future.
- to be close to the entry points of air and sea transportation.
- to be close to the manpower and housing supply.
- to be have easy and economical acquisition of the project site.
- to be close to the readily available supportive infrastructures - electricity, fresh water supply, and roadways.

7) Project Operation and Management

The project is expected to be developed by a private developer with assistance from the concerned governmental authorities as described in sub-section, above: Required conditions. The project operation and management will also be carried out by private investor and management group. Particularly, for a successful operation, close relations with tour operators, air carriers, transportation operators, and travel agents, are prerequisites.

8) Project Implementation Plan (See Fig. 12.4)

Time Schedule

- Inception and site selection	6 months
- Feasibility study	6 months
- Application for the availment of incentives	1 year
- Detailed Design/Documentation/Bidding	6 months
- Construction/pre-opening training	1 1/2 years
Total	4 years

Project Costs

- Land Acquisition	₱ 250,000
- Construction	₱3,000,000
- Furnishing/Pre-opening Training/Promotion/Misc.	₱1,750,000
- Total	₱5,000,000

9) Effects

The project is estimated to create approximately 75 employment opportunities directly and indirectly, and support the subsistence of approximately 420 residents.

12.5 Recommendation

The success of the tourism development is solely dependent upon the coordination of the public and private sectors and timing of every single development components.

For this reason, the following recommendations are a pre-requisite to to initiation of tourism development in Bohol.

- Institutional reform should be made at the earliest possible time in sucy a way that an ad-hoc governmental agency has an authority on policy making, planning, implementation, controlling, supervision, and coordination of inter-governmental agencies at the Provincial level.
- A physical masterplan of the tourism development in Bohol should be drafted to illustrate the conceptual direction and magnitude of the development.
- A feasibility study should be promptly carried out for the proposed Sea Resort Hotel development.