7. Environment

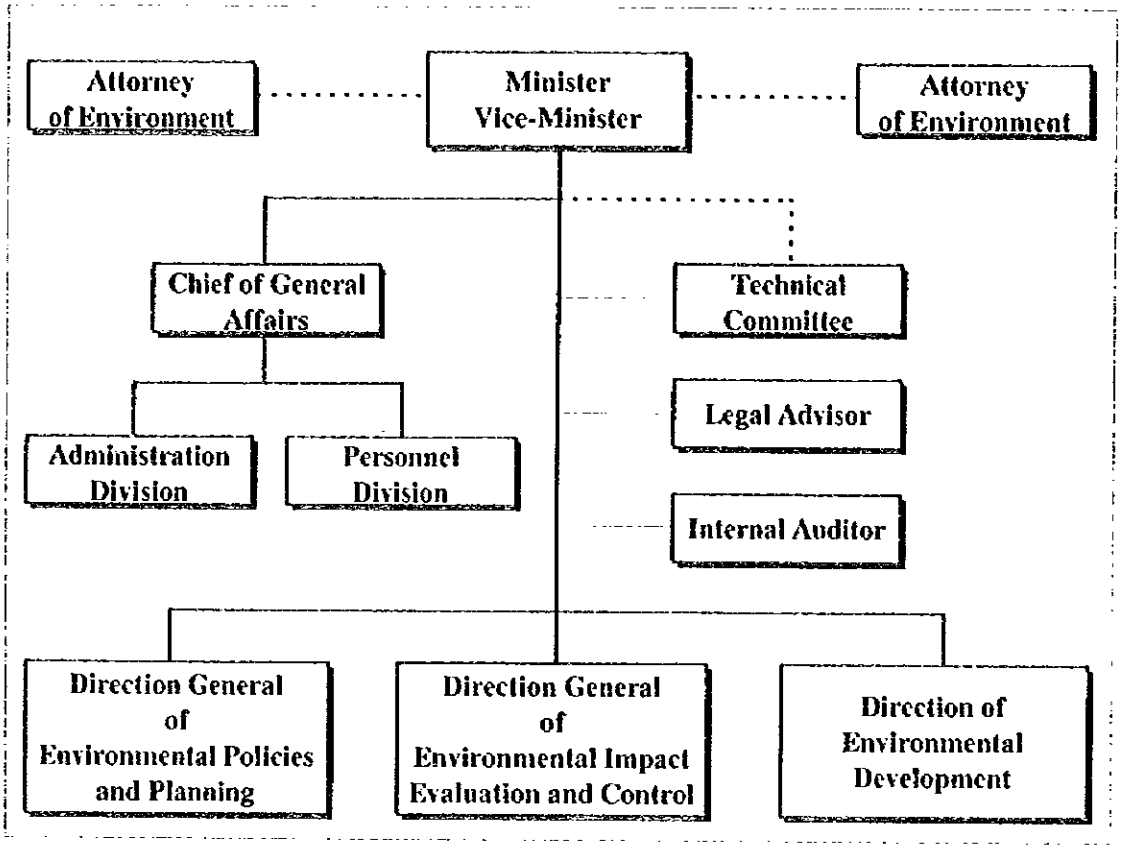
7.1 Environmental Organization/System

7.1.1 Administration of the Environment

The former Ministry of Environment (Secretaria de Estado en el Despacho del Ambiente; SEDA) was in charge of administering matters pertaining to environmental management and conservation (see the organizational chart of the former SEDA). But, it was integrated into the Ministry of Natural Resources to become the Ministry of Natural Resources and Environment at the end of 1996. Despite this integration, its major functions have not changed at present; and it continues to carry out surveys, data collection, planning, coordination with other related institutions, supervision, in addition to environmental assessment evaluations of projects, issuing licenses (Licencia Ambiental), etc.

The right of Departments to utilize the natural resources in their region was established under the Regional Municipal Law (Ley de Municipalidades) enacted in 1990. However, in conjunction with these rights, the law also obliges Departments to establish an environmental protection agency. At present, such agencies have been established only in the three cities of Tegucigalpa, San Pedro Sula, and Puerto Cortes.

Organization Chart of SEDA (1996)



7.1.2 Legal System Pertaining to the Environment

(1) Domestic law

- General Law of the Environment (Ley General del Ambiente, 1993): This is a comprehensive law that targets sustainable social development by balancing the use of natural resources and environmental conservation. It regulates environmental assessment and the participation of the inhabitants of regional municipalities in environmental protection activities, etc.
- Regulation on a National System of Evaluation on Environmental Impact (Reglamento del Sistema Nacional de Evaluacion de Impacto Ambiental, 1992)/ Environmental Assessment Guidelines (Manual Tecnico del Sistema Nacional de Evaluacion de Impacto Ambiental: 1994): Based on the General Law of the Environment, this regulation is concerned with regulating the objectives of environmental assessment, procedure, documents to be submitted, reviews, etc.
- Fisheries Law (Ley de Pesca, 1959): This law regulates fisheries, the registry of fisheries activities, protection of fisheries resources, etc. It is a ministerial

ordinance (formerly the Ministry of Natural Resources) that regulates fishing season, fishing method, and fish size. Presently, major fishing restrictions include closed seasons for fishing (shrimp, lobster, etc.), regulations on size (lobster, crab, conch, etc.), fishing laws (restrictions on mesh size, prohibitions on net fishing in lagoons and other designated areas).

(2) International agreements

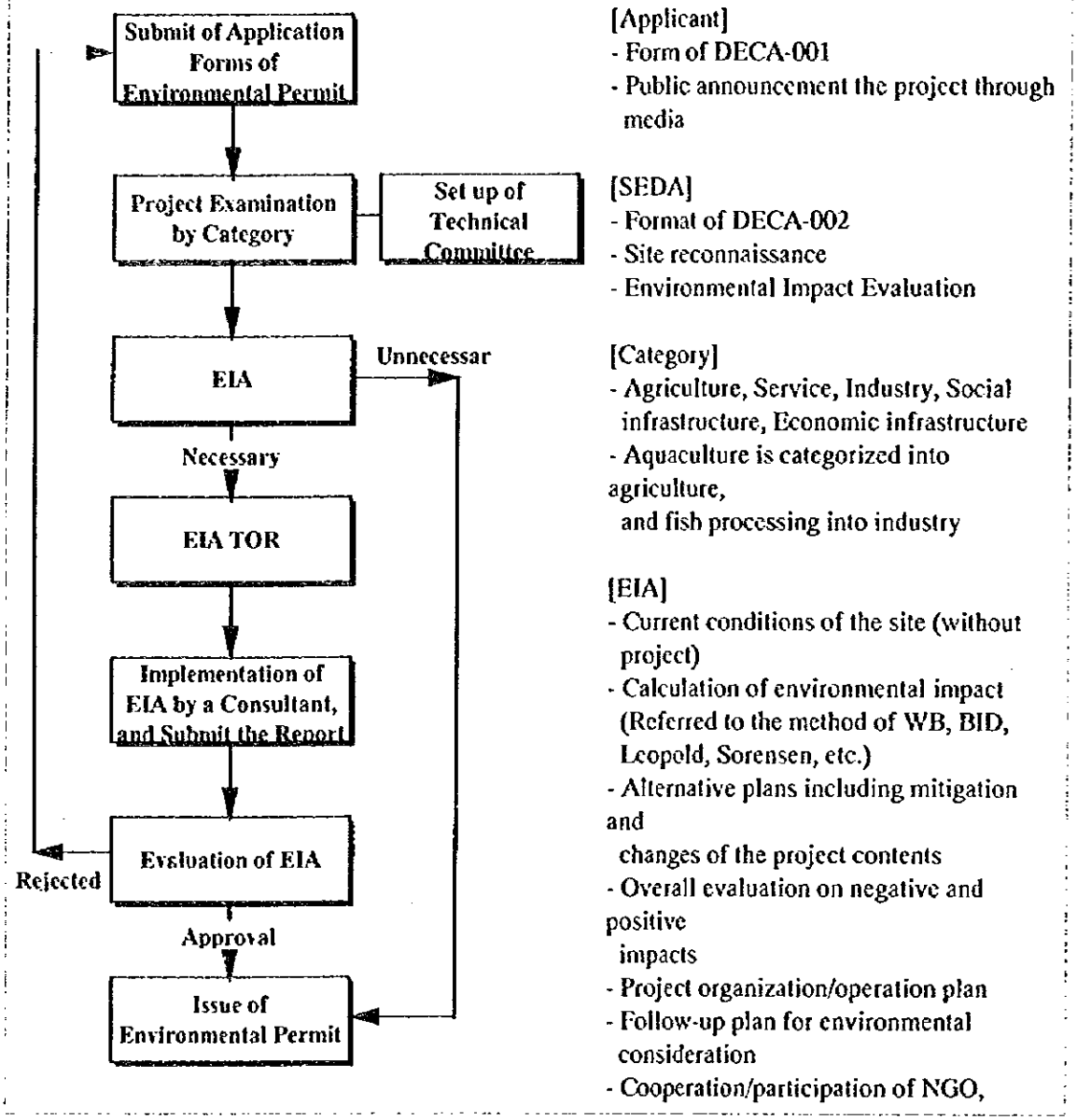
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention): Honduras became a member in 1985. Presently, sea turtles, crocodiles, manatees, and the pink conch cannot be harvested and sold commercially without a license from DIGEPESCA.
- Convenio Constitutivo Centroamericano Para la Proteccion del Ambiente, 1990: Promotes regional cooperation in environmental protection measures such as designating priority areas for environmental protection, and protection of a diverse range of plants and animals in the region.

7.1.3 System of Environmental Impact Assessment (EIA)

Based on the environmental laws mentioned above, a system of environmental impact assessment (Evaluacion de Impacto Ambiental, henceforth referred to as EIA) has been established. The implementing agencies of private and/or public sector projects must apply for an environmental license (Licencia Ambiental) from SEDA and the project must be reviewed before it can be implemented. For projects which are determined as having a significant environmental impact by SEDA scientific committee members, the implementing agency is asked to conduct an EIA and the content of the project is subjected to a review. The procedure for an EIA is carried out according the guidelines established in the Environmental Assessment Guidelines mentioned above. Among the fisheries development projects, a shrimp culture project was asked to implement an EIA, but none have been implemented for projects to promote fisheries or develop fish marketing.

EIA procedures are shown in the figure below.

EIA Procedures



7.2 Environmental Considerations

7.2.1 Natural Environment

(1) Fragile environment

The natural environment of the Honduran coast is susceptible to the negative impact of development measures, due to the following factors.

1) Mangrove forest

Mangrove forests are distributed widely throughout Fonseca Bay on the south coast, but only on a relatively smaller scale in Punta Sal, and Guainoreto and Caratasca Lagoons in the north coast. The mangrove forests are disappearing in Fonseca Bay due to shrimp culture, salt farms, etc., but there have been no reports of serious damage in the northern coastal area due to the lack of such industries, and of felling mangrove trees for firewood.

2) Coral reefs

Coral reefs are found in the cape Punta Sal, the Utila Island, the Bahia Islands, the islands of Cayos Cochinos in the Western Region, and in the islands of Cayos Vivorillo and Arecifes in the Eastern Region. Fishing methods using dynamite or poison which destroy the coral reefs are presently strictly prohibited and the reefs have suffered no serious damage. However, there have been reports that 40 to 90 percent of the coral reefs in Bahia Islands have been damaged, due to tourism development and the erosion of earth and sand.

3) Rare animals

COHDEFOR, a public forestry corporation, compiled a list of animal species on the verge of extinction in the Honduras in 1994. The list pinpointed 108 species of animals and 35 species of plants. Of the water animals that exist in the coastal areas, the manatee, the sea turtle (five species), shellfish (four species), black coral, and Cuyamel (fresh water fish, a species of the cichlide family) were designated.

(2) Consideration to fisheries resources

It has been deduced that there are developed and undeveloped fishing grounds, in view of the apprehensions voiced by fishermen on declining fisheries resources and the large high value fish landed from virgin resources. A segment of the fishermen in Trujillo have begun using the echo sounder in their fishing operations. This equipment has made the discovery of good fishing grounds easier and it has accelerated the development of resources. Red fish (snappers, groupers, etc.) are rocky bottom/demersal fish that are high valued exportable fish. Many fishermen would like to harvest red fish found in the bottom of offshore reef waters, but these waters are perilous for non-motorized canoes. As a result, fishing efforts to these resources seem to be not very great at present. However, red fish matures at a slower rate than other

fish in general. If fishing efforts using modernized boats will increase, the resources will be readily affected. Presently, there is very little knowledge about the characteristics of fishing grounds and resources of these species.

The Cayosco Chinos Marine Park and the Punta Sal National Park are areas which have been designated for environmental protection in the Western Region. There have been 12 incidents of illegal fishing operations in the Cayosco Chinos Marine Park in the first half of 1996. There is the possibility that further illegal fishing operations in environmental protection areas or across national borders will rise in future, since motorization of fishing boats by a development project allows fishermen to expand their fishing range. Therefore, in conjunction with measures to promote fisheries, activities to educate fishermen on resources management and to foster a law abiding mentality are needed.

Currently, fisheries in the Eastern Region are characterized by seasonal fisheries (October to March) which are carried out to meet the national demand for salted and dried fish during the Semana Santa season. Robalo is a particularly important species targeted by fisheries in this region. There is a tendency for fisheries to become active during the months of October to December when robalo migrate to coastal and brackish waters. The seasonal fisheries of this region have traditionally coincided with the migratory season of robalo; and it appears that this practice has protected existing resources during the off-season or the months following Semana Santa. Fish transport boats will be introduced under this master plan project, in order to establish a fish transport system to the Western Region and thereby, promote year around fisheries. As a result, there is the fear that this may destroy the existing system that has traditionally protected the fisheries resources of this region. Therefore, it is important to clarify the migratory ecology of the robalo scientifically, in order to restrict fisheries so that it does not impede the spawning process of the robalo, in conjunction with a measure to promote fisheries.

In addition, the robalo that migrate to the coast are extremely fecund (FAO, 1986) and therefore, they will be greatly affected by an increase in fishing effort. Presently, illegal fishing operations are carried out in the estuaries of this region. Educational and training programs that will make fishermen aware of the importance of respecting fisheries laws are needed in this region, as in the Western Region.

(3) Consideration to other natural elements

The Eastern Region contains a wide expanse of untouched natural environment. Although the development of coastal mangroves is limited in comparison to the Pacific side, there are red mangroves (*Rhizophara mangal*) near lagoons, particularly in Cauquira and Cruta/Recuperada. Measures must be taken not to affect the coastal mangroves during the process of developing fisheries.

Colonies of the brown pelican (*Pelicanus occidentalis*) which is most commonly seen and a representative water bird of the northern coastal area, are found in Utila Island, Miscos Lagoon, Cochinos Island, etc. In addition, there are an estimated 100 manatees (*Trichechus manatus*) inhabiting the north coast. They are found in Miscos Lagoon, Cayos Cochinos Island, and near estuaries in the Western Region and in Ibans and Tansin lagoons, and others in the Eastern Region. However, their exact numbers are unknown, due to the lack of an adequate survey study. In addition, two species of sea turtles, the leatherback turtle (*Dermochelys cariacea*), and the cauma (*Caretta caretta*) spawn along the coast of the Eastern Region from May to August. These rare animals inhabit the objective area of this Study. As a result, training programs that will educate fishermen on protecting these animals and how to handle a "mixed" fish catch in which these animals are mistakenly caught, etc. are needed.

(4) Development in environmentally protected areas

The following environmentally protected areas exist in the objective area of by this Study.

- Western Region: Punta Sal National Park in the western end of Tela and Cayosco Chinos Marine Park in the eastern offshore waters of La Ceiba
- Eastern Region: Rio Platano Natural Reserve in the western end of Brus Laguna

Of the environmentally protected areas, the Biosphere Reserve and the National Marine Park allow sustainable fisheries production activities to be carried out. However, determining whether production activities are sustainable or not must be made scientifically. Traditional fisheries are carried out in protected areas that are found in the objective area of this Study; and data on the ecology and resources must be collected and analyzed during the process of promoting sustainable fisheries.

7.2.2 Social Environment

(1) Consideration to livelihood and economic activities of the inhabitants

The major ethnic groups that inhabit the north coast are the Garifuna, a black ethnic group in the Western Region, and the Misquito who are found in the Eastern Region. Both of these groups are concentrated in the coastal areas and their livelihood is dependent on subsistence fisheries. This is an area where government assistance has lagged and the expectations of the inhabitants on modernization are high. However, the existing conditions are not always conducive to assistance measures; and rapid development may not be understood by the inhabitants. In particular, the Misquito harbor dissatisfaction at the fact that resource development in their area have been implemented by foreigners and other outsiders, who have taken the profits out of the area. In addition, due to the extremely limited employment opportunities in the area, discord may arise among the inhabitants seeking cash revenue opportunities when this project is implemented. Therefore, it is necessary for the selection procedure of the specific beneficiaries of the development measures to take such consideration as adopting an impartial method that will incorporate the participation of the inhabitants. In addition, development must be implemented impartially among the fishing villages.

In contrast, when the fish marketing system to the Western Region becomes actively established, the fish price in the fishing villages in the Eastern Region may rise. The current fish price of Lps.1~4/pound in the region is cheaper than the price of meat at Lps.6~11/pound. Fish is an important source of animal protein for the inhabitants. Therefore, fish standards based on species and size must be established, in order to avoid a chaotic system of fish transport to the Western Region and to control the rise in the local fish price.

(2) Consideration to competition with the middlemen

Presently, there are middlemen in the Eastern Region who are transporting fresh fish to the Western Region from the four locations of Brus Laguna, Puerto Lempira, Bara Patuca, and Palacios. But their presence has not stimulated current fisheries, due to the irregularity of their activities. In order to resolve this problem, one possibility is to provide a transport vessel that will be mainly operated by the fishermen to transport fresh fish. But such a measure is anticipated to create competition in certain areas with the middlemen. Therefore, the development measures to stimulate current fisheries

must take such consideration as the effective utilization of the role and activities of the existing middlemen.

8. Projection of Supply and Demand of Fish Products in The North Coast

Supply and demand of fish products in the north coast in the cases of with and without development projects for artisanal fisheries is projected as follows. Two cases of the projection period are examined: 10 years up to the year 2008, and 15 years up to the year 2012. The former is assumed to be the substantial investment period of major projects, and the latter in the period including the progress period after project investments.

(1) Population and GDP

In "II.1.1 (2) Population and GDP", some cases on the growth of population and GDP was examined. As for the future 15 years projection, the growth of population and GDP has been assumed as follows:

1) Population

SECPLAN and the Central Bank currently prospect the high growth model (or even somewhat higher growth rate) for the population after 1995. Following their prospects, in this Study, the population growth rate is assumed to take the trend as shown in the table below.

	Nationwide	Western Region	Eastern Region
Population in 1996 (×1000)	5,620	1,330	47
1996-2000 growth rate	2.90%	2.90%	3.42%
2000-2012 growth rate	2.75%	2.75%	3.26%

2) GDP

Per capita GDP growth rate in Honduras for last 15 years has not been higher than that of the population. Accordingly, in this Study, the GDP growth in future is assumed to be the similar level of the population growth.

(2) Supply/demand of fish products in 1996

As mentioned in "II.2.2 Summary of Fisheries Production", the volume of fresh fish production in 1996 was estimated to be 3,293 tons in Western Region and 1,693 tons in Eastern Region, respectively. Salted and dried fish is mostly produced in the Eastern Region, and its production volume was estimated at 495 tons based on the 1996 census results. The volume of fish import was ignored from the estimation of fish supply volume due to its smallness and no data of its destination by Region level.

As for fish demand, exported fish volume was estimated at 100 tons in the Western Region and at 48 tons in the Eastern Region, respectively. On assumption that all fresh fish except exported one was consumed within both Regions, the per capita fish consumption was estimated at 2.4kgs in the Western Region and 35.0kgs in the Eastern Region, respectively. On assumption that the salted and dried fish is consumed not only in the north coast but around the whole country, its per capita consumption is estimated at 0.09kgs.

Supply and demand of fish products in 1996 is summarized in the following table.

Table Supply and Demand of Fish Products in 1996

	Western Region	Eastern Region	Total
Population (×1000)	1,330	47	1,377
Supply of fish products (tons/year)			
Fresh fish	3,293	1,693	4,986
Dried fish	-	495	495
Gross production in the north coast	3,293	2,188	5,481
Demand for fish products (tons/year)			
Fresh fish consumption	3,193	1,645	4,838
Fresh fish export	100	48	148
Dried fish consumption	117	4	121
Flow of dried fish outside of the area	-	374	374
Gross demand in North Coast	3,410	2,071	5,481
Per capita fish consumption (kg/year)			
Fresh fish consumption	2.4	35.0	-
Dried fish consumption	0.09	0.09	0.09

(3) Supply and demand of fish products without projects

1) Conditions of projection

The projection method based on the trend of statistical data was not taken due to low reliability of the fisheries statistics. In this Study, projected figures has been obtained in the figures of increased volume of population, number of fishermen, fish consumption, fish export, etc., according to each Region by the year 2008 and the year 2012 starting from the year 1998, based on the following assumption.

a. Growth rate of artisanal fisheries in the north coast:

Under the stagnant circumstances of traditional industries, the current GDP growth is supported by other industries such as manufacturing industries in San Pedro Sula. Therefore it can not be anticipated that artisanal fisheries without development

projects will show the same growth of GDP.

The growth rate of fresh fish production, fresh fish export and dried fish production of artisanal fisheries is assumed to take trend of annually 1.4%, that is the half of anticipated average GDP growth rate of 2.8% (assumed to be the same growth rate of the population) during the period of 1996-2012.

b. Population:

Starting the population of each Region in 1996, estimated by following formula,

Population of this year = (Population of the previous year) × (Population growth rate)

c. Number of fishermen:

Starting the number of fishermen in 1996, the number will increase at the annual growth rate of 1.4%

d. Export volume and fresh fish production volume:

On the regional basis, estimated by following formula;

Export of this year = (Export of the previous year) × 1.014

Production of this year = (Production of the previous year) × 1.014

e. Fresh fish consumption:

On the regional basis, estimated by following formula;

Consumption of this year = (Fresh fish production of this year) – (Export of this year)

Per capita consumption of this year = (Fresh fish consumption of this year) ÷ (Population of this year)

f. Production/consumption of dried fish:

On assumption that dried fish is uniformly consumed in whole country, estimated by following formula;

Dried fish production of this year = (Dried fish production of the previous year) × 1.014.

Per capita dried fish consumption of this year = (Dried fish production of this year) ÷ (National population of this year).

Dried fish consumption of this year by each Region =

(Per capita dried fish consumption of this year) × (Population of this year by each Region).

2) Result of projection

Based on the above mentioned projection conditions, the supply and demand of fish products without projects after 10 years is projected as shown in the table below.

Since the growth of production is lower than that of the population, the per capita fish consumption in the north coast will diminish. In Western Region it will decrease from 2.4kg/year in 1996 to 2.0kg/year (about 17% decrease) in 2008, and in Eastern Region from 35.0kg/year in 1996 to 26.0kg/year (about 20% decrease) in 2008.
The supply and demand in the year 2012 is shown in the Table 8.1.

Table Supply of and Demand for Fish Products in 2012 (without projects)

	Western Region	Eastern Region	Total
Population (×1000)	1,853	70	1,923
Supply of fish products (tons/year)			
Fresh fish	3,893	2,001	5,894
Dried fish	-	585	585
Gross production in the north coast	3,893	2,586	6,479
Demand for fish products (tons/year)			
Fresh fish consumption	3,776	1,941	5,717
Fresh fish export	117	60	177
Dried fish consumption	163	6	169
Flow of dried fish outside of the area	-	416	416
Gross demand in the north coast	4,056	2,423	6,479
Per capita fish consumption (kg/year)			
Fresh-fish consumption	2.0	27.9	3.0
Dried fish consumption	0.09	0.09	0.09

(4) Supply and demand of fish products with projects

1) Conditions of projection

a. Direction of development measures:

As described in (3), per capita fish consumption might diminish if artisanal fisheries will be left behind without development projects.

Such future conditions will not be desirable for Honduras, not only from view point of obstructing the development of fisheries industry but also of unstabilizing the supply of animal protein.

It would be unrealistic to expect a large increase of the number of fishermen, or of fish catch volume by their self-efforts since current artisanal fisheries have strong subsistence character, and do not have surplus money for a new investment. Therefore, it is at least required to maintain the level of per capita fish consumption in 1996 through taking development measures of modernizing current ways of fishing and improving fish marketing. It is also necessary to try to increase fresh fish export which could expect high valued fish sales.

b. Population growth rate: same rate as assumed in (1).

c. Per capita fresh-fish consumption: Same level as in the year 1996.

d. Fresh fish consumption:

On the regional basis, estimated by the following formula ;

Fresh-fish consumption = Per capita fresh-fish consumption × the population of the year

e. Fresh-fish export:

In 1996 the export volume was only 100 tons in Western Region and 48 tons in Eastern Region. This is caused by insufficiency of fresh fish which can satisfy the export conditions. It would be possible to increase fresh fish export in the wide range in case the export conditions in terms of fish type, size, freshness, etc. are satisfied through modernization of current fisheries. Therefore, the export volume with projects could be expected at 2 times of the one without projects.

Fresh fish export volume = Fresh fish export volume without projects × 3

f. Fish shipment from the Western region to the Eastern region:

In the Eastern Region the fish catch is mainly for self-consumption and even if they sell, the price is much lower than that in the Western Region. Therefore fish shipment from the Eastern Region to the Western Region is planned in order to increase the income level of fishermen. The shipment volume is assumed to be the amount equal to the increased volume of fresh fish export without projects on the Western Region.

Shipment of volume = Volume of fresh-fish export without projects × 2

g. Volume of fish production in the Western Region

Volume of fish production =

Volume of fish consumption + Volume of fish export – Volume shipped from the Eastern Region.

h. Volume of fish production in Eastern Region

Volume of fish production =

Volume of fish consumption + Volume of fish export + Volume shipped from the Eastern Region.

i. Volume of dried fish production/consumption : the same volume as the case without projects.

2) Results of the projection

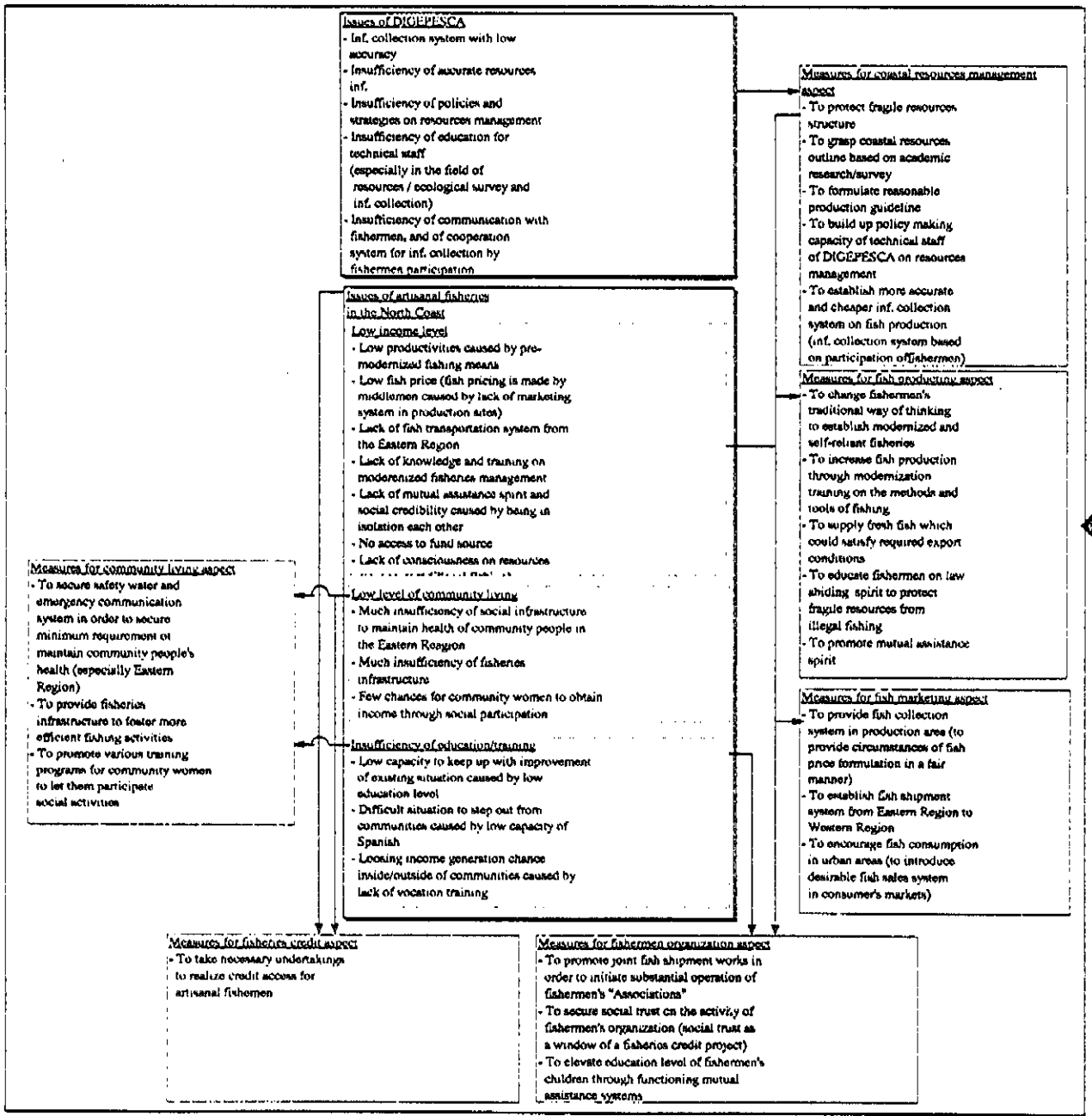
Based on the above mentioned projection conditions, the supply and demand of fish products with projects after 10 years is projected as shown in the table below. The fish production with projects in the year 2008 is projected at 7,998 tons. Compared with the projected production of 6,479 tons without projects, the surplus will be 1,519 tons. The per capita fish consumption of the north coast in 1996 would be maintained, and fresh fish export would be added more 354 tons/year. The supply and demand in the year 2012 is shown in the Table 8.2 (1)~(2).

Table Supply Demand of Fish Products in 2012 (with projects)

	Western Region	Eastern Region	Total
Population (×1000)	1,853	70	1,923
Supply of fish products (tons/year)			
Fresh fish	4,567	2,846	7,413
Dried fish	-	585	585
Gross production in the north coast	4,567	3,431	7,998
Demand for fish products (tons/year)			
Fresh fish consumption	4,450	2,432	6,882
Fresh fish export	351	180	531
Dried fish consumption	163	6	169
Flow of dried fish outside of the area	-	416	416
Gross demand in the north coast	4,964	3,034	7,998
Per capita fish consumption (kg/year)			
Fresh fish consumption	2.4	35.0	3.6
Dried fish consumption	0.09	0.09	0.09

9. Issues and Measures on Artisanal Fisheries in the North Coast

Based on the present conditions of artisanal fisheries in the north coast as described in II.1~8, issues and measures on the fisheries are summarized in the following Figure.



Issues and Measures on Artisanal Fisheries Develoment in the North Coast

Table 1.1 Main Economic Indicators

unit:%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Real Growth Rate of GDP	4.2	0.7	6.0	4.6	4.3	0.1	3.3	5.6	6.1	-1.5	3.3
Real Growth Rate of Per Capita GDP	0.9	-2.6	2.7	1.3	1.4	-2.9	0.3	2.7	0.7	-4.6	0.3
Fisical Deficit (as % of GDP)	7.2	5.8	6.2	6.6	7.4	5.9	2.2	3.7	10.1	7.5	4.5
Inflation Rate (CPI)	3.4	4.4	2.5	4.5	9.9	23.3	34.0	8.7	10.8	21.7	29.5

Source : Banco Central

Table 1.2 Population and its density

Department	Populatio (x 1,000)		Growth Rate 1988 - 1995	Housing in 1988 (x 1,000)	Surface (km2)	Density in 1995 (P/km2)	Villages in 1988
	1988	1995					
1 Atlantida	240	297	3.0%	50	4,251	70	229
2 Colon	151	190	3.4%	31	8,875	21	136
3 Comayagua	242	306	3.4%	49	5,196	59	283
4 Copan	221	270	2.9%	44	3,203	84	336
5 Cortes	667	806	2.7%	140	3,954	204	291
6 Choluteca	298	360	2.7%	57	4,211	85	194
7 El Paraiso	256	313	2.9%	49	7,218	43	233
8 Francisco Morazan	834	994	2.5%	174	7,946	125	276
9 Gracias a Dios	35	45	3.7%	7	16,630	3	67
10 Intibuca	126	154	3.0%	23	3,072	50	126
11 Isla de la Bahia	22	28	3.2%	6	261	106	23
12 La Paz	108	133	3.1%	21	2,331	57	114
13 Lempira	178	218	2.9%	34	4,290	51	299
14 Ocotepeque	75	91	2.9%	16	1,680	54	129
15 Olancho	286	361	3.4%	56	24,351	15	289
16 Sta.Barbara	281	339	2.7%	57	5,115	66	366
17 Valle	121	147	2.8%	24	1,565	94	86
18 Yoro	336	412	3.0%	66	7,939	52	263
- Whole Country	4,476	5,463	2.9%	907	112,088	49	3,740

Sources : 1) Censo National de Poblacion y Vivienda 1988 y Division Politica Territorial 1974

2) Proyecciones des Poblacion de Honduras por Sex y Edad 1988-2050

Remarks:1) Population in 1988 ; based on "Censo Nacional de Poblacion 1988".

2) Population in 1995 ; based on the estimation shown in source 2).

Table 1.3 GDP (at 1978 constant price) of Honduras in 1980 - 1994

Unit : Millions of 1978 Lempiras

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Gr6wth
GDP by Sector																	
I. Primary Production	**1,051**	**1,067**	**1,124**	**1.061**	**1,143**	**1,169**	**1,155**	**1,212**	**1,224**	**1,349**	**1,357**	**1,439**	**1,496**	**1,490**	**1,503**	**1,609**	**3.0%**
1. Agriculture	985	1,007	1,052	983	1,056	1,080	1,072	1,161	1,155	1,271	1,285	1,364	1,413	1,404	1,415	1,513	3.1%
2. Mining	66	60	72	78	87	89	83	51	69	78	72	75	83	86	88	96	1.7%
II. Secondary Production	**783**	**758**	**770**	**826**	**882**	**880**	**865**	**926**	**997**	**1,059**	**1,055**	**1,062**	**1,179**	**1,297**	**1,206**	**1,234**	**3.7%**
1. Manufacturing	529	526	502	534	575	582	606	646	678	704	709	721	765	813	798	819	3.5%
2. Construction	202	176	208	228	240	221	177	184	211	242	218	212	284	344	278	272	2.7%
3. Public Utilities	52	56	60	64	67	77	82	96	108	113	128	129	130	140	130	143	7.6%
III. Services	**1,825**	**1,932**	**1,852**	**1,825**	**1,831**	**1,923**	**2,020**	**2,114**	**2,227**	**2,279**	**2,259**	**2,287**	**2,403**	**2,609**	**2,641**	**2,702**	**2.8%**
1. Transport & Comminucarions	249	276	297	305	317	329	334	348	372	396	411	423	441	456	476	497	4.4%
2. Commerce	560	586	518	480	462	463	507	517	531	507	503	514	529	572	579	604	0.6%
3. Banking, Insur. & Real Estate	209	220	207	211	230	235	247	264	299	325	335	367	402	449	475	505	6.6%
4. Housing	209	220	232	244	236	254	258	272	288	300	313	323	334	347	363	378	4.0%
5. Public Admin. & Defense	262	289	278	266	273	316	314	329	331	341	291	280	291	334	279	252	0.3%
6. Personal Services	336	341	320	319	313	326	360	384	406	410	406	380	406	451	469	466	2.7%
IV. GDP at Factor Cost	**3,659**	**3,757**	**3,746**	**3,712**	**3,856**	**3,972**	**4,040**	**4,252**	**4,448**	**4,687**	**4,671**	**4,788**	**5,078**	**5,396**	**5,350**	**5,545**	**3.1%**
- Net Indirect Taxes	407	412	365	361	394	456	420	477	499	474	495	546	556	589	547	566	3.1%
V. GDP at Market Price	**4,066**	**4,169**	**4,111**	**4,073**	**4,250**	**4,428**	**4,460**	**4,729**	**4,947**	**5,161**	**5,166**	**5,334**	**5,634**	**5,985**	**5,897**	**6,111**	**3.1%**
GDP by Expenditure													5.6%	6.2%	-1.5%	3.6%	
I. Gross Domestic Expenditure	**4,191**	**4,066**	**3,825**	**3,803**	**4,166**	**4,244**	**4,323**	**4,586**	**4,924**	**5,078**	**5,031**	**5,322**	**5,613**	**6,104**	**6,209**	**6,208**	**3.5%**
1. Consumption	3,233	3,259	3,296	3,246	3,469	3,504	3,727	3,809	3,930	4,121	4,043	4,157	4,303	4,476	4,478	4,672	2.7%
- *Private*	*2,742*	*2,762*	*2,816*	*2,774*	*2,980*	*2,989*	*3,164*	*3,212*	*3,279*	*3,452*	*3,464*	*3,637*	*3,716*	*3,879*	*3,897*	*4,154*	*2.8%*
- *Public*	*491*	*497*	*480*	*472*	*489*	*515*	*563*	*597*	*651*	*669*	*579*	*520*	*587*	*597*	*581*	*518*	*1.7%*
2. Gross Domestic Investment	958	807	529	557	697	740	596	777	994	957	988	1,165	1,310	1,628	1,731	1,536	6.6%
a. Fixed Investment	948	738	649	660	750	726	591	630	764	920	877	879	1,116	1,513	1,484	1,315	4.6%
- *Private*	*578*	*423*	*298*	*272*	*285*	*328*	*326*	*379*	*503*	*622*	*570*	*553*	*599*	*847*	*972*	*823*	*6.6%*
- *Public*	*370*	*315*	*351*	*388*	*465*	*398*	*265*	*251*	*261*	*298*	*307*	*326*	*517*	*666*	*512*	*492*	*2.2%*
b. Charge in Stocks	10	69	-120	-103	-53	14	5	147	230	37	111	286	194	115	247	221	n.a.
II. Resource Balance	**-125**	**103**	**286**	**270**	**84**	**184**	**137**	**143**	**23**	**83**	**135**	**12**	**21**	**-119**	**-312**	**-97**	n.a.
1. Export of Goods & NFS	1,506	1,549	1,391	1,401	1,395	1,500	1,527	1,564	1,550	1,629	1,637	1,604	1,732	1,713	1,540	1,709	1.1%
2. Import of Goods & NFS	1,631	1,446	1,105	1,131	1,311	1,316	1,390	1,421	1,527	1,546	1,502	1,592	1,711	1,832	1,852	1,806	2.4%
III. Gross Domestic product	**4,066**	**4,169**	**4,111**	**4,073**	**4,250**	**4,428**	**4,460**	**4,729**	**4,947**	**5,161**	**5,166**	**5,334**	**5,634**	**5,985**	**5,897**	**6,111**	**3.1%**
Per Capita GDP (Lps)	**1,186**	**1,176**	**1,122**	**1,076**	**1,087**	**1,096**	**1,068**	**1,096**	**1,110**	**1,121**	**1,086**	**1,085**	**1,109**	**1,140**	**1,088**	**1,091**	**-0.3%**
Population (x 1,000)	3,431	3,545	3,663	3,785	3,911	4,041	4,175	4,313	4,457	4,605	4,758	4,916	5,079	5,248	5,422	5,603	3.3%

Source : Banco Central de Honduras

Table 1.4 Trend of the Budget of Ministry of Natural Resources

Unit:Lps

Division	年 1993	1994	1995
- Oficina del Ministro (Minister Office)	4,913,200	3,703,600	13,267,591
- Unidad de Planificacion Sectorial (Sector Planning Unit)	1,915,600	2,315,600	1,711,680
- Unidad de Planificacion Institucional (Institution Planning Unit)	1,337,958	1,373,338	1,460,150
- Direccion de Ciencia y Tecnologia(Science and Technology Department :DICTA) antes Direccion General de Agricultura	44,697,413	27,635,876	13,193,020
- Servicio Nacional de Sanidad Agropecuaria (National Service of Agricultural Sanitation : SENASA) antes Direccion General de Ganaderia	11,839,570	11,908,114	12,329,200
- Direccion General de Pesca y Acuicultura	3,251,304	3,160,268	3,659,408
- Direccion General de Recursos Hidricos (Directrate General of Water Resources)	6,680,078	4,119,688	5,630,859
- Direccion General de Minas e Hidrocarburos (Directorate General of Mining and H	1,642,735	1,642,745	1,697,815
Sub-total	76,277,858	55,859,229	52,949,723
- Transferencia Corrientes (Cash Transfer)	15,407,396	18,128,456	44,861,671
- Transferencia de Capital (Capital Transfer)	48,691,272	63,774,215	47,422,089
- Construcciones Agricolas Corrientes (CAC)	2,539,950	45,000,005	139,084,925
- Duoracion de Equipo (Doration of Equipment)	2,456,821	2,452,046	362,500
Sub-total	69,095,439	129,354,722	231,731,185
Grand total	145,373,297	185,213,951	284,680,908

Source:Made by the Planning/Development Department of DIGEPESCA, based on the information of UPI

Table 1.5 List of Projects in 1994-1998 National Fisheries/Aquaculture Development Plan

Unit : US$

Projects	Fund Source	Progress	Implementation Agency	Period	Cost		
					Internal	External	Total
Under implementation							
Resources evaluation of shrimp and lobster	OLDEPESCA C.E.E	Execution	DIGEPESCA PRADEPESCA	1	37,577.0	33,733.0	71,310.0
Evaluation of post-larvae potencial in Fonseca Bay	OLDEPESCA C.E.E	Execution	DIGEPESCA PRADEPESCA	1	10,000.0	48,000.0	58,000.0
Bivalva (Oyster) culture in Pacific Zone	FONDOS PROPIOS	Execution	INFOP	4	60,000.0		60,000.0
Agroaquaculture project	OLDEPESCA C.E.E	Execution	DIGEPESCA PRADEPESCA	4	50,000.0	381,678.0	431,678.0
Water analyses of FOnseca Bay	AID Universidad de Auburn	Ejecucion	Esc. Agricola DIGEPESCA		10,000.0	50,000.0	60,000.0
Sub-total					167,577.0	513,411.0	680,988.0
Under negociation of fund assistance							
Tilapia culture for export	BID	Gestion	DIGEPESCA	10	180,000.0	4,336,270.0	4,516,270.0
Master plan of artisanal fisheries in north coast	JICA	Gestion	DIGEPESCA	4	100,000.0	4,450,000.0	4,550,000.0
Molusca culture (curiles)	BID	Gestion	DIGEPESCA	4	25,000.0	225,000.0	250,000.0
Capacity building of DIGEPESCA staff (Training, survey research, development)	C.E.E FAO	Gestion	DIGEPESCA	3	40,000.0	1,500,000.0	1,540,000.0
Support for commercialization of artisanal fisheries in Fonseca Bay	C.E.E.	Gestion	DIGEPESCA PRADEPESCA	3	20,000.0	180,000.0	200,000.0
Pathological lab. of Penacid shrimps	BID	Gestion	Sector Privado	4	50,000.0	3,000,000.0	3,050,000.0
Sub-total					415,000.0	13,691,270.0	14,106,270.0
Project/idea level							
Production of shrimp / salt by rotation	Mision China	Idea	DIGEPESCA	2	10,000.0	65,000.0	75,000.0
Processing factory for artisanal fisheries	not identified	Idea	INFOP	2	10,000.0	90,000.0	100,000.0
Sub-total					20,000.0	155,000.0	175,000.0
Institutional action							
Modernization of public fisheries sector	not identified		DIGEPESCA	1	40,000.0	50,000.0	90,000.0
Statistical information system	not identified		DIGEPESCA	1	50,000.0	25,000.0	75,000.0
Sub-total					90,000.0	75,000.0	165,000.0
Programs							
Inspection / control of fisheries	not identified		DIGEPESCA F. NAVAL	4	100,000.0	140,000.0	240,000.0
Training of human resources	not identified		DIGEPESCA, UNAH, INFOP,Sect. Privado	4	600,000.0	520,000.0	1,400,000.0
Sub-total					700,000.0	660,000.0	1,640,000.0
Grand Total					1,392,577.0	15,094,681.0	16,767,258.0

Table 2.1 Number of Persons Engaged in Fishery Sector

Scale/Field	1988	1989	1990	1991	1992	1993	1994	1995	1996
	←	Fishery		→		Fonseca Bay Census		PRADEPESCA Survey	ANAH
1. Industrial Fisheries									
Processing <1	984	999	1,014	1,029	—	—	—	—	3,208
Fishing <1	4,263	4,327	4,392	4,458	—	—	5,936	—	—
Registerd boat	(356)	(292)	(325)	(288)	(335)	(331)	(315)	(327)	(—)
Shrimp farming	1,950	3,120	3,900	6,037	—	—	—	—	14,243
Pond area (Ha)	(—)	(—)	(—)	(—)	(—)	(—)	11,322	(—)	(13,620)
Sub-total	7,197	8,446	9,306	11,524	—	—	—	—	—
2.Artisernal fisheries									
Independent <1	4,353	4,418	4,484	4,551	—		—	Pacific 12,900	—
Employed <1	671	681	691	701	—	Only Pacific	—	Atlantic 9,132	—
Subsistence <1	547	555	563	571	—	6,629	—	Inland 448	—
Fish trader <1	415	421	427	433	—	—	—	—	—
Sub-total	5,986	6,075	6,165	6,256	—	—	—	—	—
Total	13,183	14,521	15,471	17,780	—	—	—	—	—

- Source : 1988~1991 : Fisheries statistics
  1993 : Fonseca bay artisanal fishery census
  1995 : Nation-wide artisanal fishery survey by PADEPESCA
  1996 : Association of Honduras Aquaculture Industry
- Remarks <1: Figure of the fisheries statistics show increases at the rate of 1.4% annually.

Table 2.2 Fishery Production by Scale, Area and Fish Type

Unit : MT

Scale/Area/Fish Type	1988	1989	1990	1991	1992	1993	1994	1995
I. Industrial Fisheries								
1) Boat Fishing (Atlantic only)								
Shrimp	1,467	358	902	855	1,158	1,273	1,318	2,366
Lobster	1,149	742	838	1,218	670	523	449	899
Fish	113	278	493	494	271	226	504	348
Conch	130	412	165	723	414	485	402	356
Cuttlefish	4	5	9	-	3	2	4	3
Bivalve, Crab, Others	-	-	-	-	-	-	-	-
Sub-total	2,863	1,795	2,407	3,290	2,516	2,509	2,677	3,972
2) Aquaculture								
Shrimp (Pasific only)	1,373	1,255	2,519	4,032	3,173	2,911	3,870	491<1
Tilapia (Inland)	191	142	213	176	125	138	-<2	-<2
Sub-total	1,564	1,397	2,732	4,208	3,298	3,049	3,870	491
Industrial Total	4,427	3,192	5,139	7,498	5,814	5,558	6,547	4,463
II. Artisanal Fisheries								
1) North coast (Atrantic)								
Shrimp	32	2	145	79	51	21	34	92
Lobster	4	5	13	59	7	1	1	16
Fish	214	5	361	331	186	174	142	406
Conch	-	-	51	52	-	-	-	22
Cuttlefish	-	-	-	-	-	-	-	-
Bivalve, Crab, Others	16	9	32	39	8	1	9	21
Sub-total	266	21	602	560	252	197	186	557
2) South coast (Pacific)								
Shrimp	34	67	42	340	133	52	1,441	8
Lobster	2	2	1	2	1	1	-	2
Fish	194	165	386	279	461	207	1,088	22
Conch	-	-	-	-	-	-	-	-
Cuttlefish	-	-	-	-	-	-	-	-
Bivalve, Crab, Others	102	355	23	16	39	3	47	23
Sub-total	332	589	452	637	634	263	2,576	55
3) Inland								
Fish, Others	36	33	38	101	91	77	-	58
Artisanal Total	634	643	1,092	1,298	977	537	2,762	670
Grand-Total	5,061	3,835	6,231	8,796	6,791	6,095	9,309	5,133

Source:FIshery statistics 1988-95

Remarks <1:Decreased caused by Virus disease

<2:Stop of support activities of USAID which was the data source concerned for DIGEPESCA

Table 2.3 Export of Fish Products (1988-1995)

Unit:MT

Items	1988	1989	1990	1991	1992	1993	1994	1995
Shrimp	4,145	3,431	4,415	6,171	8,085	10,591	10,256	9,235
Lobster	1,936	1,891	1,901	2,335	1,809	1,312	1,045	1,066
Fish <1	131	3	5	6	6	5	9	31
Others(Conch, etc.)	225	838	410	731	N/A	N/A	N/A	N/A
Total	6,437	6,163	6,731	9,243	9,900	11,908	11,310	10,332

Source:1988-91,SECPLAN Statistical Office

1992-95,Central Bank

Table 2.4 Domestic Marketed Volume of Fish by Scale, Area, Fish Type (based on fish trader's report)

Unit : MT

Scale/Area/Fish Type	1988	1989	1990	1991	1992	1993	1994	1995
I. Industrial Fisheries								
1) Boat Fishing (Atlantic only)								
Shrimp	58	60	169	78	5	9	48	93
Lobster	73	79	209	20	10	8	23	16
Fish	31	35	68	50	6	4	4	406
Conch	94	54	12	67	80	3	39	22
Cuttlefish	1	3	1	-	3	-	2	3
Bivalve, Crab, Others	-	-	-	-	-	-	-	20
Sub-total	257	231	459	215	104	24	116	560
2) Aquaculture								
Shrimp (Pasific only)	31	91	149	141	131	93	39	-<1
Tilapia (Inland)	191	142	213	176	125	138	-<2	-<2
Sub-total	222	133	362	317	256	231	39	-
Industrial Total	479	364	821	532	360	255	155	560
II. Artisanal Fisheries								
1) North coast (Atrantic)								
Shrimp	32	2	145	79	51	21	34	92
Lobster	4	5	13	59	7	1	1	16
Fish	214	5	361	331	186	174	142	406
Conch	-	-	51	52	-	-	-	22
Cuttlefish	-	-	-	-	-	-	-	-
Bivalve, Crab, Others	16	9	32	39	8	1	9	21
Sub-total	266	21	602	560	252	197	186	557
2) South coast (Pacific)								
Shrimp	34	67	42	340	133	52	14	8
Lobster	2	2	1	2	1	1	-	2
Fish	194	165	386	279	461	207	1,088	22
Conch	-	-	-	-	-	-	-	-
Cuttlefish	-	-	-	-	-	-	-	-
Bivalve, Crab, Others	102	355	23	16	39	3	47	23
Sub-total	332	589	452	637	634	263	1,149	55
3) Inland								
Fish, Others	36	33	38	101	91	77	-	58
Artisanal Total	634	643	1,092	1,298	977	537	1,335	670
Grand-Total	1,113	1,007	1,913	1,830	1,337	792	1,490	1,230

Source:Fishery statistics 1988-95

Remarks <1:Decreased caused by Virus disease

<2:Stop of support activities of USAID which was the data source concerned for DIGEPESCA

Table 3.1 Per Capita Major Agricultural Product Consumption in Honduras.

Unit : kg/year/person

Items	M.P.	Urban	Rural	National	Middle	North	South	East	West
Corn	69.7	82.0	170.4	132.6	177.2	99.6	212.6	159.4	181.6
Beans	15.4	18.7	25.0	21.7	25.8	20.3	19.9	30.2	24.9
Rice	18.6	18.5	13.3	18.9	12.8	19.2	12.1	15.7	13.2
Wheat	5.0	6.1	2.9	3.8	0.3	9.9	0.9	1.1	1.2
Vegetable	38.9	35.8	19.5	27.0	21.7	27.4	15.6	23.4	30.8
Meat	28.8	24.1	10.2	17.0	29.5	20.4	9.5	13.6	7.8
Fish products	1.5	2.5	2.0	2.1	1.8	4.4	2.2	1.3	1.1

Source : Food Consumption Survey, SECPLAN, 1987

Table 3.2 Per Capita Fish Consumption in Case of Urban Peoaple Who Used to Eat Fish

Unit : kg/year

Name of City	Type of Product			
	Fresh Fish	Dried Fish<1	Cans<1	Total
Tegucigalpa (Capital)	15.5	10.4	11.1	37.0
San Pedro Sula (Cortes Dept.)	9.0	4.2	14.5	27.8
La Ceiba (Atlantida Dept.)	14.0	5.6	2.9	22.5
Tocoa (Colon Dept.)	19.5	7.3	22.6	49.4
Comayagua (Comayagua Dept.)	7.2	9.8	5.8	22.8
Juticalpa (Olancho Dept.)	10.1	6.4	4.5	21.0

Source : Result of Fish Market Survey in this Study
Remarks <1: Converted to fresh fish weight (Conversion rate : 0.6)

Table 4.1 A List of Artisanal Fisheries Assistance Projects in the Western Region (1/2)

1) EC Assistance Projects			
Project Name	The Project of Reorientation of Artisanal Fisheries 1978 to 1984		
Implementation Period	EEC Assistance	Lps:	2,938.000
Scale of the Project	BID Loan*	Lps:	2,938.000
	Honduran Government:	Lps:	3,668,000
	Total:	Lps:	10,430,000
	*BID = Inter American Development Bank		
Implementing Agency	DIFOCOOP (Cooperative Development Directorate)		
Summary of the Project	Fishermen cooperatives were set up in Omoa, Tela, Trujillo, and Coyolito (Fonseca Bay of Pacific coast), in order to foster artisanal fisheries. European manufactured Cygnus fishing boats, fishing gear, fish landing facilities (jetty, ice-making cold storage facility, etc.), motor vehicles, management and maintenance costs were provided. Training programs in ice-making and freezing technology, fishing technology, operating a cooperative, etc. were provided for the aforementioned fishermen's cooperative. However, the fish catch of the modern Cygnus fishing boats was only 6% of the initial target, due to insufficient training of the boat crew. This was compounded by the lack of management and operational skills of the cooperative; and they were unable to repay their loans. As a result, the cooperative in Coyolito went bankrupt in 1985, the Omoa and Tela cooperative in 1986, and the Trujillo cooperative in 1987.		
2) Assistance Projects by the	**Canadian Government**		
Project Name	Proyecto programa de la Tecnologia Pescuera Artesanal		
Implementation Period	1989 to 1991		
Scale of the Project	US$12,500		
Implementing Agency	UNAH		
Summary of the Project	The project fostered fishermen cooperatives in Encenada and Triunfo de La Cruz in the Tela area and carried out training programs in building fishing boats, the production of fishing nets, repair and maintenance of fishing gear, and fishing technology. A total of 40 fishermen participated in the training programs. Two fishing boats were built and materials for gill nets, four 15HP outboard engines and one set of ice boxes were provided. The cooperatives were established in both villages and joint fishing operations comprised of 10 fishermen per cooperative were carried out. Presently, both the fishing boats and outboard engines are in disrepair and joint fishing operations as well as the cooperatives are no longer active. A similar form of assistance was implemented from 1989 to 1990 in El Provenir and a fishermen cooperative consisting of 24 members was established. Two fishing boats, two outboard engines, gill net material, and two beach seines were provided. Presently, one boat, gill net, and outboard engine are in disrepair and the number of members have gradually diminished, but one fishing boat, and beach seine are still being used by the remaining five members in joint fishing operations.		

Table 4.1 A List of Artisanal Fisheries Assistance Projects in the Western Region (2/2)

3) Assistance Project by the	**Taiwanese Government**
Project Name	Proyecto de Apoyo a la Pesca Artesanal de Honduras
Implementation Period	1991 to the present
Scale of the Project	Unknown, due to the lack of an implementation plan
Implementing Agency	Unknown. DIGEPESCA is the contact agency.
Summary of the Project	Ten Taiwanese fishing boats (raft type fishing vessel), 10 outboard engines, and one gill net (50m x 8m) have been provided. Originally, the project targeted Miami, a typical fishing village in the Tela area, but the project was discontinued after the fishermen in Miami returned the rafts, claiming that they were unsuited to the ocean conditions in that area. Presently, the targeted villages have been changed to Tornabe, San Juan, and Triunfo de Cruz located in the urban area of Tela. Four improved raft type boats with planks attached to their broadsides have been provided and 15 fishermen in groups of four have participated in a training program on their operations. Four seminars have been implemented in June from 1994 to 1996; and a total of 77 fishermen have received training in outboard engine repair, navigation, net and longline fishing techniques, repairing fish nets, fishing methods, etc.
4) Assistance Project by the	**Japanese Government**
Project Name	Artes de Pesca en el Mini Proyecto en Trujillo: MODERPESCA
Implementation Period	1992 to 1994
Scale of the Project	¥5,300,000
Implementing Agency	DIGEPESCA
Summary of the Project	In order to promote the structural foundations of fisheries and its expansion, technical transfer activities were carried out to strengthen fishermen organizations, supervise business activities of fishermen households, improve fishing gear and fishing method, promote motorization of fishing boats, quality control of the fish catch, etc. 17 FRP fishing boats, 28 15HP outboard engines, 2 small trucks, 16 freezers, fishing gear materials, computer, etc. were provided by the project. Various types of training programs in fishing technology were implemented for 33 groups of fishermen, each comprised of three to four members from Trujillo and the neighboring fishing villages of Puerto Castillas, Santa Fe, etc. As of 1996, two years after the project was completed, 27 groups have continued independent joint fishing operations and fishermen incomes have risen. However, renewal costs for boats, outboard engines, etc. were not included in the project. As a result, real independent fisheries have not been achieved.

Table 5.1 Number of Fishermen's Association Members in the Northern Coastal Region

(as of February 1997)

Area Fishermen's Associations	Members according to village unit	Number of members <1	Number of fishermen group	Number of registered fishermen <2	Area name
ASMIPARCO	8	83	35	360	Cortés
ACEPA	6	159	52	1,209 (La Ceiba =722) (Tela = 487)	Atlántida
APESATEL	8	346	114	1,209 (La Ceiba = 722) (Tela = 487)	Atlántida
ASOPESCA	5	365	107	671	Colón
INSDABRUL	0	50	-<4	3,114 <3 (B. Laguna = 1,055) (P. Lempira = 2,509)	Gracias a Dios
CAUYULA	0	30	-<4	3,114 (B. Laguna =1,055) (P. Lempira = 2,509)	Gracias a Dios
APACAZORE	5	1,251	-<4	3,114 (B. Laguna = 1,055) (P. Lempira = 2,509)	Gracias a Dios
Total	32	2,284	308	5,354	

Source: 1996 Census data and data on fishermen associations obtained from Phase I and II study.

Remarks <1. Number of fishermen associations per village in each area
2. Number of fishermen registered with DIGEPESCA, excluding the area of Gracias a Dios
3. Number of fishermen engaged in fish retail activities..
4. No fishermen groups have been formed.

Table 8.1 Supply and Demand Projection of Fish Products in the North Coast (without projects)

		Western Region	Eastern Region
Population Increase Rate			
1996 - 2000		2.90%	3.42%
2000 - 2012		2.75%	3.26%
Per Capita Fresh Fish Consumption	kg/yr.	2.40	34.96
Per Capita Dried Fish Consumption	kg/yr.	0.09	0.09
Growth Rate of Fish Production		1.40%	1.40%
Growth Rate of Fish Export		1.40%	1.40%

Year		Population (x 1,000)		Demand of Fish Products									Supply of Fish Products				Per capita fresh fish consumption	
				Fresh Fish Co.		Dried Fish Co.		Out-flow of	Export			Total	Fresh	Fresh	Dried	Total		
		West	East	West	East	West	East	Dried fish	West	East	Total	Demand	West	East		supply	West	East
-1	1996	1,330	47	3,193	1,645	117	4	374	100	48	148	5,481	3,293	1,693	495	5,481	2.4	35.0
0	1997	1,368	49	3,238	1,668	120	4	378	101	49	150	5,558	3,339	1,717	502	5,558	2.4	34.3
1	1998	1,408	50	3,284	1,691	124	4	381	102	50	152	5,636	3,386	1,741	509	5,636	2.3	33.6
2	1999	1,449	52	3,331	1,714	128	5	383	103	51	154	5,715	3,434	1,765	516	5,715	2.3	32.9
3	2000	1,491	54	3,378	1,738	131	5	387	104	52	156	5,795	3,482	1,790	523	5,795	2.3	32.3
4	2001	1,532	56	3,426	1,762	135	5	390	105	53	158	5,876	3,531	1,815	530	5,876	2.2	31.7
5	2002	1,574	57	3,475	1,786	139	5	393	106	54	160	5,958	3,581	1,840	537	5,958	2.2	31.1
6	2003	1,618	59	3,524	1,811	142	5	398	107	55	162	6,042	3,631	1,866	545	6,042	2.2	30.6
7	2004	1,662	61	3,573	1,836	146	5	402	109	56	165	6,127	3,682	1,892	553	6,127	2.1	30.0
8	2005	1,708	63	3,623	1,862	150	6	405	111	57	168	6,214	3,734	1,919	561	6,214	2.1	29.5
9	2006	1,755	65	3,673	1,888	155	6	408	113	58	171	6,301	3,786	1,946	569	6,301	2.1	28.9
10	2007	1,803	67	3,724	1,914	159	6	412	115	59	174	6,389	3,839	1,973	577	6,389	2.1	28.4
11	2008	1,853	70	3,776	1,941	163	6	416	117	60	177	6,479	3,893	2,001	585	6,479	2.0	27.9
12	2009	1,904	72	3,829	1,968	168	6	419	119	61	180	6,570	3,948	2,029	593	6,570	2.0	27.4
13	2010	1,956	74	3,882	1,996	172	7	422	121	62	183	6,662	4,003	2,058	601	6,662	2.0	26.9
14	2011	2,010	77	3,936	2,024	177	7	425	123	63	186	6,755	4,059	2,087	609	6,755	2.0	26.4
15	2012	2,066	79	3,991	2,052	182	7	429	125	64	189	6,850	4,116	2,116	618	6,850	1.9	26.0

Table 8.2 (1) Supply and Demand of Fish Products in the North Coast (with projects)

		Western Region		Eastern Region	
Population Increase Rate					
1996 - 2000		2.90%		3.42%	
2000 - 2012		2.75%		3.26%	
Per Capita Fresh Fish Consumption	kg/yr.	2.40		34.96	
Per Capita Dried Fish Consumption	kg/yr.	0.09		0.09	
		W/O	W	W/O	W
Growth Rate of Fresh Fish Production		1.40%	2.5%	1.40%	4.5%
Growth Rate of Dried Fish Production		-	-	1.40%	1.4%
Growth Rate of Fish Export		1.40%	4.4%	1.40%	10.1%

Year		Population (x 1,000)		Demand of Fish Products									Supply of Fish Products					
				Fresh Fish Consumption		Dried Fish Consumption		Out-Flow of Dried Fish	Export			Total Demand	Fresh	Fresh	Shipment to West	Total	Dried	Total supply
		West	East	West	East	West	East		West	East	Total		West	East			East	
-1	1996	1,330	47	3,193	1,645	117	4	374	100	48	148	5,481	3,293	1,693	0	1,693	495	5,481
0	1997	1,368	49	3,238	1,668	120	4	378	101	49	150	5,558	3,339	1,717	0	1,717	502	5,558
1	1998	1,408	50	3,381	1,691	124	4	381	204	50	254	5,835	3,585	1,741	0	1,741	509	5,835
2	1999	1,449	52	3,479	1,714	128	5	383	258	51	309	6,018	3,737	1,765	0	1,765	516	6,018
3	2000	1,491	54	3,580	1,810	131	5	387	312	156	468	6,381	3,788	1,966	104	2,070	523	6,381
4	2001	1,532	56	3,679	1,943	135	5	390	315	159	474	6,626	3,853	2,102	141	2,243	530	6,626
5	2002	1,574	57	3,780	2,006	139	5	393	318	162	480	6,803	3,921	2,168	177	2,345	537	6,803
6	2003	1,618	59	3,885	2,072	142	5	398	321	165	486	6,988	3,992	2,237	214	2,451	545	6,988
7	2004	1,662	61	3,992	2,139	146	5	402	327	168	495	7,179	4,101	2,307	218	2,525	553	7,179
8	2005	1,708	63	4,101	2,209	150	6	405	333	171	504	7,375	4,212	2,380	222	2,602	561	7,375
9	2006	1,755	65	4,214	2,281	155	6	408	339	174	513	7,577	4,327	2,455	226	2,681	569	7,577
10	2007	1,803	67	4,330	2,355	159	6	412	345	177	522	7,784	4,445	2,532	230	2,762	577	7,784
Target		*1,828*	*68*	*4,390*	*2,394*	*161*	*6*	*414*	*348*	*179*	*527*	*7,891*	*4,506*	*2,572*	*232*	*2,804*	*581*	*7,891*
11	2008	1,853	70	4,450	2,432	163	6	416	351	180	531	7,998	4,567	2,612	234	2,846	585	7,998
12	2009	1,904	72	4,572	2,511	168	6	419	357	183	540	8,216	4,691	2,694	238	2,932	593	8,216
13	2010	1,956	74	4,698	2,593	172	7	422	363	186	549	8,441	4,819	2,779	242	3,021	601	8,441
14	2011	2,010	77	4,827	2,677	177	7	425	369	189	558	8,671	4,950	2,866	246	3,112	609	8,671
15	2012	2,066	79	4,960	2,764	182	7	429	375	192	567	8,909	5,085	2,956	250	3,206	618	8,909

Table 8.2(2) Supply and Demand Projection of Fish in the North Coast (with projects)

Year		Fresh Fish Production (without)		Fresh Fish Deficit (without)		Export Increase (with)			Shipment from East	Fresh Fish Increase (with)			Fresh Fish Production (with)			Dried	Grand Production
		West	East	West	East	West	East	Total		West	East	Total	West	East	Total	East	
-1	1996	3,293	1,693	0	0	0	0	0	0	0	0	0	3,293	1,693	4,986	495	5,481
0	1997	3,339	1,717	0	0	0	0	0	0	0	0	0	3,339	1,717	5,056	502	5,558
1	1998	3,386	1,741	97	0	102	0	102	0	199	0	199	3,585	1,741	5,326	509	5,835
2	1999	3,434	1,765	148	0	155	0	155	0	303	0	303	3,737	1,765	5,502	516	6,018
3	2000	3,482	1,790	202	72	208	104	312	104	306	280	586	3,788	2,070	5,858	523	6,381
4	2001	3,531	1,815	253	181	210	106	316	141	322	428	750	3,853	2,243	6,096	530	6,626
5	2002	3,581	1,840	305	220	212	108	320	177	340	505	845	3,921	2,345	6,266	537	6,803
6	2003	3,631	1,866	361	261	214	110	324	214	361	585	946	3,992	2,451	6,443	545	6,988
7	2004	3,682	1,892	419	303	218	112	330	218	419	633	1,052	4,101	2,525	6,626	553	7,179
8	2005	3,734	1,919	478	347	222	114	336	222	478	683	1,161	4,212	2,602	6,814	561	7,375
9	2006	3,786	1,946	541	393	226	116	342	226	541	735	1,276	4,327	2,681	7,008	569	7,577
10	2007	3,839	1,973	606	441	230	118	348	230	606	789	1,395	4,445	2,762	7,207	577	7,784
Target		*3,866*	*1,987*	*640*	*466*	*232*	*119*	*351*	*232*	*640*	*817*	*1,457*	*4,506*	*2,804*	*7,310*	*581*	*7,891*
11	2008	3,893	2,001	674	491	234	120	354	234	674	845	1,519	4,567	2,846	7,413	585	7,998
12	2009	3,948	2,029	743	543	238	122	360	238	743	903	1,646	4,691	2,932	7,623	593	8,216
13	2010	4,003	2,058	816	597	242	124	366	242	816	963	1,779	4,819	3,021	7,840	601	8,441
14	2011	4,059	2,087	891	653	246	126	372	246	891	1,025	1,916	4,950	3,112	8,062	609	8,671
15	2012	4,116	2,116	969	712	250	128	378	250	969	1,090	2,059	5,085	3,206	8,291	618	8,909

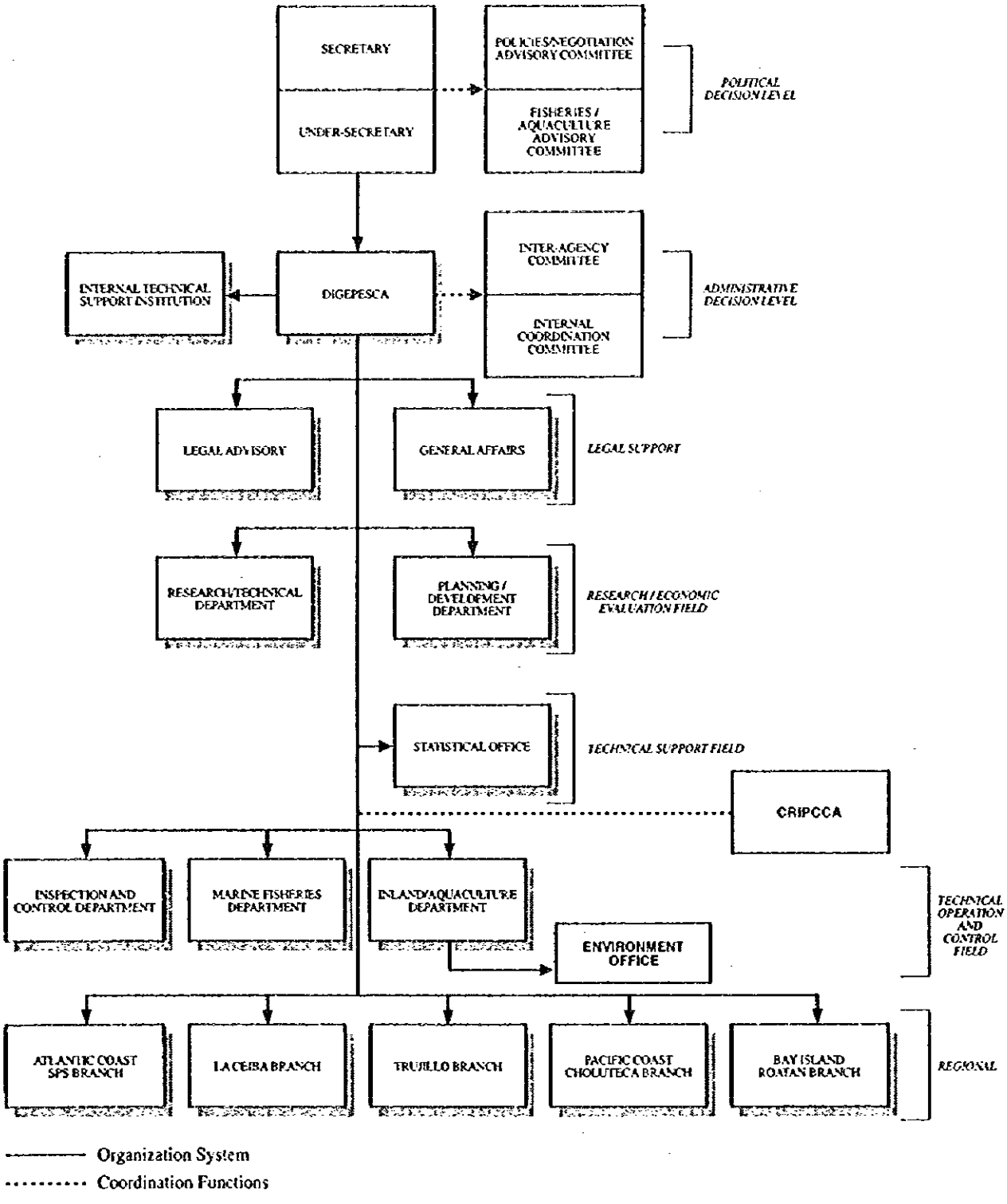


Fig. 1.1 Organizational Chart of DIGEPESCA

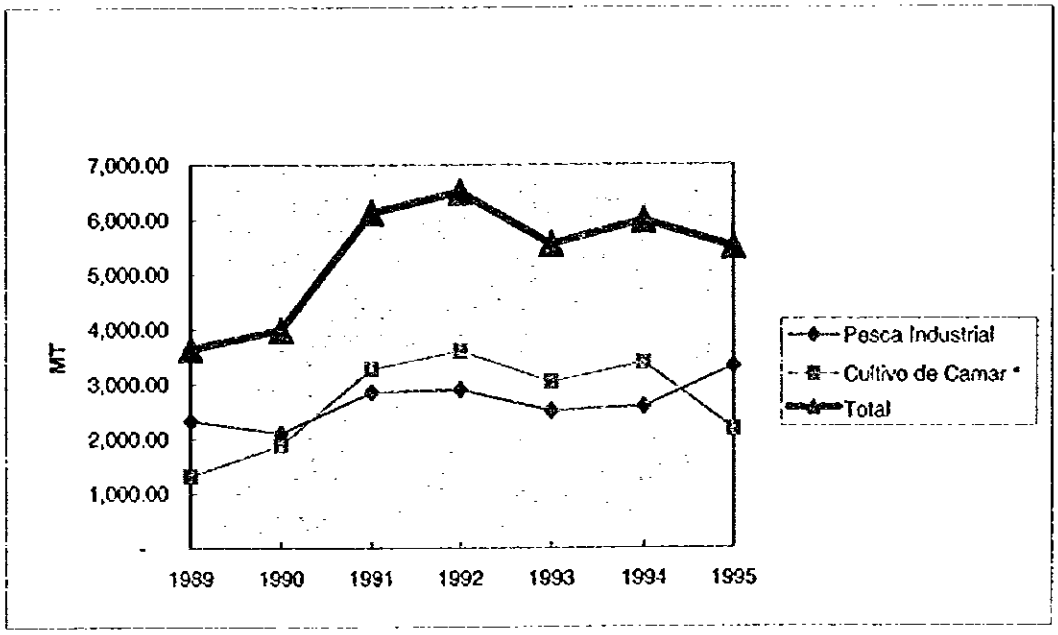


Figure 2.1 Fishing Production Behaviour in the Industrial Fisheries Sector
Remarks: Production in 1995 was reduced because of a decrease.

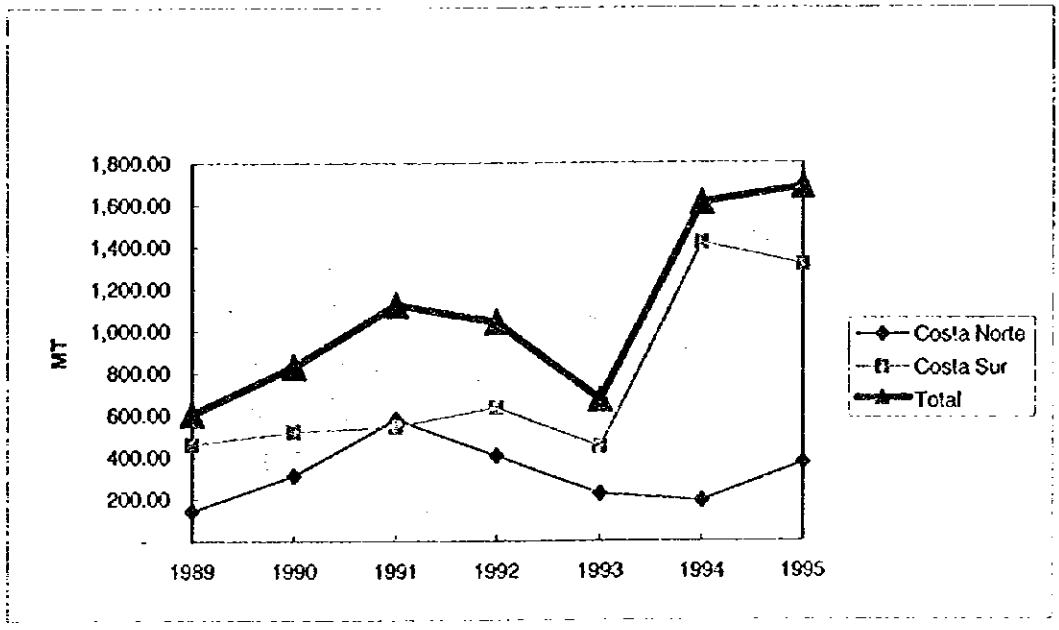
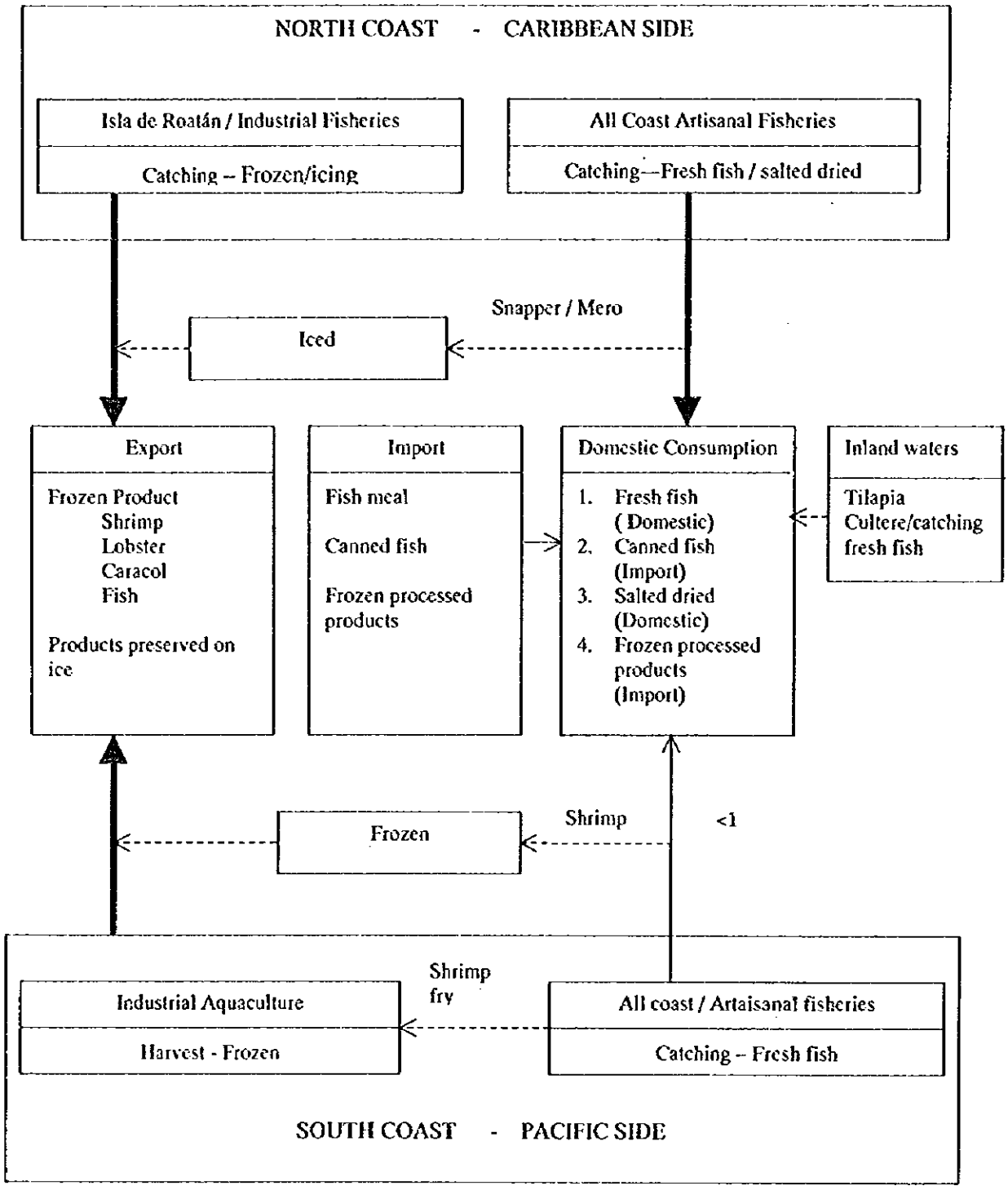


Figure 2.2 Fishing Production Behavior in the Artisanal Fisheries Sector.



Remarks:

Large scale (1,000 ~5,000 ton/year)

Middle scale (200 ~1,000 ton/year)

Small scale (menos de 200 ton/year)

Remarks: <1: Estimated based on DIGEPESCA staistical figures only

Figure 2.3 Production Structure of Honduras Fishing Industry

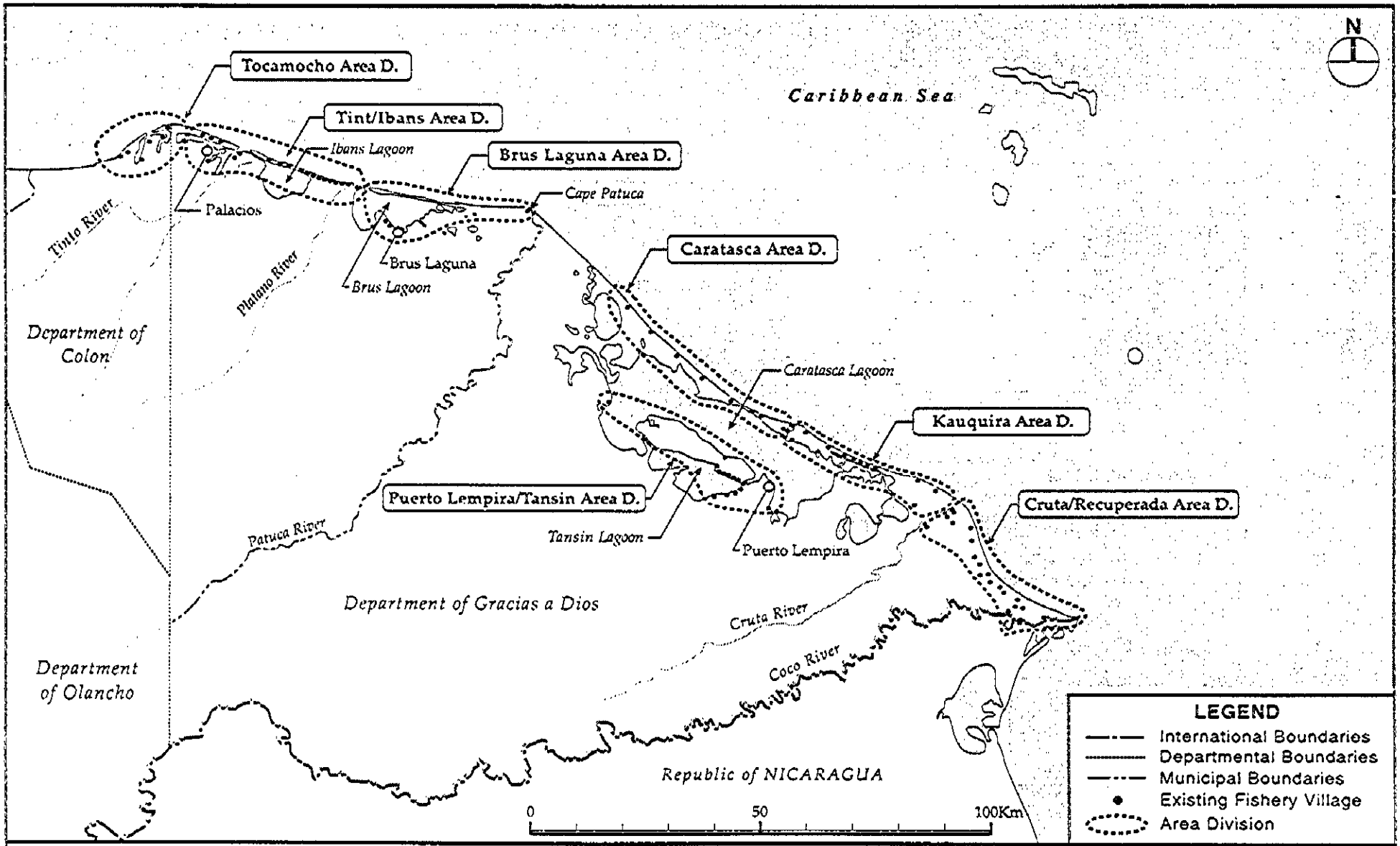
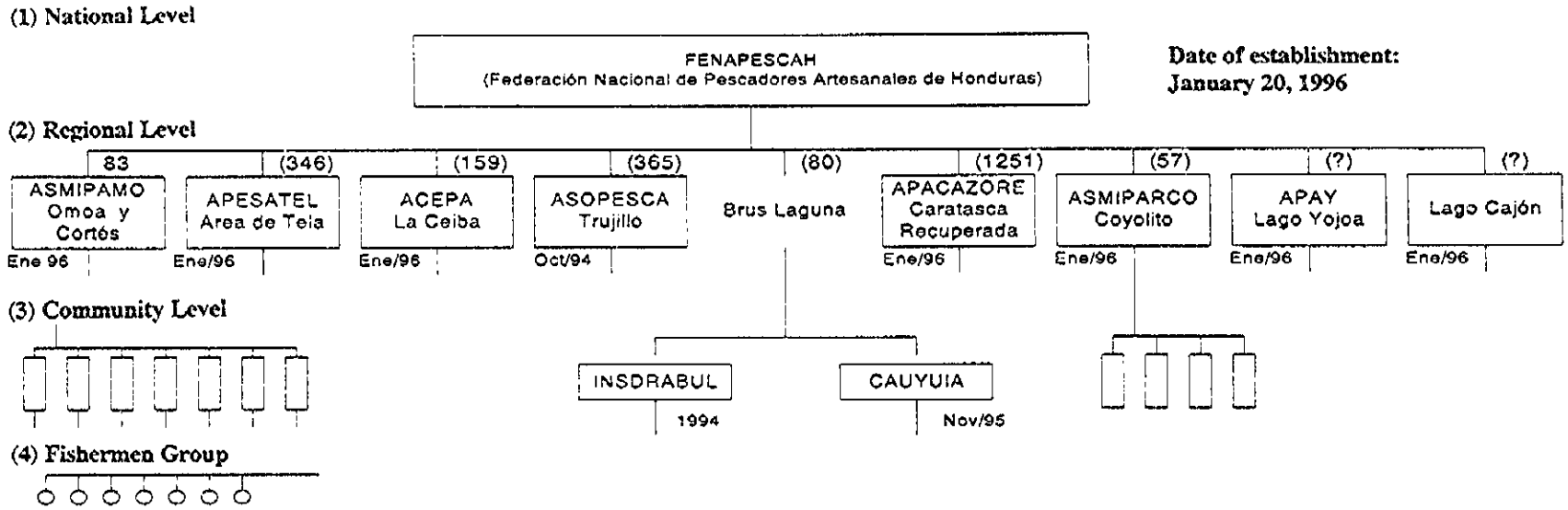


Figure 4.1 DISTRIBUTION OF FISHING COMMUNITY BY AREA DIVISION IN EASTERN REGION

THE MASTER PLAN STUDY ON SMALL SCALE FISHERIES DEVELOPMENT PROJECT ON THE NORTH COAST OF THE REPUBLIC OF HONDURAS



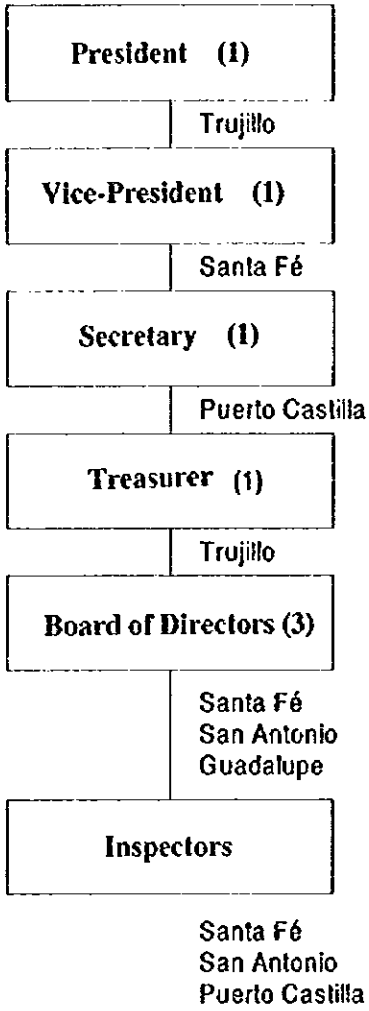
Remarks <1:

1.	ASMIPAMO:	Asociación de Microempresas de Pescadores Artesanales del Municipio de Omoa
2.	APESATEL:	Asociación de Pescadores de Tela
3.	ACEPA:	Asociación Ceibeña de Pescadores Artesanales
4.	ASOPESCA:	Asociación de Pescadores de Trujillo
5.	INSDABRUL:	Asociación de Pescadores de Brus Laguna
6.	CAUYUIA:	
7.	APACAZORE:	Asociación de Pescadores de Caratasca y Zona Recuperada
8.	ASMIPARCO:	Asociación de Pescadores Artesanales de Coyolito
9.	APAY:	Asociación de Pescadores de Yojoa
10.		Embalse de Cajón

Remarks <2:

1. The number between parenthesis indicate association in the North coast.
2. The number of members as of February 1997.
3. One group is composed of 2-3 members.
4. No regional revel organization exist in Brus Laguna Area.
5. No fishermen group exist in Brus Laguna and Caratasca

Figure 5.1 Organization Chart of Fishermen Associations in Honduras



Remarks:
1. The board of directors will act on behalf of the president and other members durling their absence
2. Names of areas where the appointed official comes from.
3. The same system is applied to these of national regional and community level.
4. The number between parenthesis indicates the number of executive members.

Figure 5.2 Organization Structure of Fishermen Association in Trujillo Area

III. PLANNING

Ⅲ. PLANNING

1. Development Policy

1.1 Measures and Scope of Artisanal Fisheries Development in the North Coast

As explained in "Ⅱ.PRESENT CONDITIONS", development measures for the artisanal fisheries in the north coast are summarized as follows:

a. To harmonize fisheries development with sustainable utilization of coastal resources.
b. To modernize fisheries activities and to make fishermen aware of self-reliant fisheries.
c. To improve marketing system of fish products
   - To form fish price on fishermen's initiative.
   - To establish fish transport system from the Eastern Region to the Western Region.
   - To promote fish consumption of the people.
d. To improve the infrastructure of fishing communities for the efficient and healthy fishing activities.
e. To support women's participation in the fishing activities.
f. To activate fishermen organizations.
g. To promote fisheries credit projects in order to foster self-reliant fisheries.

Apart from these development measures, the development range in this master plan is set up as follows:

(1) To set up development contents which enable fishermen, fishermen's organizations and community women to make aware of self-reliant spirits, and to bring out their self-support effort to the maximum. In the former stage of the plan for about a decade, provisions of training facilities / equipment and training program will be taken place in order to foster their self-reliant spirit. In the latter stage, only the credit projects will be taken place to support and promote their self-reliant activities.

(2) It is estimated at about 9,000 fishermen in the north coast, including those who go fishing for their own consumption. The objective fishermen of this plan are limited to those who go fishing in order to sell their fish catch. The number of objective fishermen is as follows:

Western Region	2,240 fishermen
Eastern Region	3,114 fishermen
Total	5,354 fishermen

1.2 Target of the Plan

1.2.1 Target Year

The first year of the plan is set up in 1998, and the plan period is 15 years, that is, the last year is 2012. This is divided into three short-terms, the 1st, 2nd. and 3rd short-terms. Each short-term is for five years.

1.2.2 Target Fish Production Volume

This plan will provide the total volume of the deficiency of the future fish supply in north coast and the planned increase of fish exports, which are estimated in " Ⅱ .8 PROJECTION OF SUPPLY/DEMAND OF FISH PRODUCTS IN THE NORTH COAST." The target volume of fish products in the end of the 2nd short-term and in the end of the 3rd short-term are as follows (Detailed in Ⅱ .8.1 and 8.2 (1)-(2)) :

In the end of the 2nd. short-term (2007)	: about 1,500 tons/year
In the end of the 3rd. short-term(2012)	: about 2,100 tons/year

1.2.3 Target Income Level of Fishermen

This plan will raise current income level of fishermen in both Regions which are shown in "4.3 Income Level of Fishermen" at least up to the following level by the end of the 2nd short-term.

	Income ($/family/year)		
Region	Current	Target (2007)	Growth Rate(%)
Western Region	1,078	1,246<1	15.6
Eastern Region	853	1,078	26.4

Remarks<1:Aeveraged figure between the national level(US$ 1,078/year.) and that of the urban area (US$ 1,415) (See details in Ⅱ .4.3).

1.3 Development Strategy

1.3.1 Basic Approach to the Development Measures

The basic approach, the contents of sector plans of this master plan, to the aforementioned seven development measures, is shown in the following table:

Development Measures	Basic approach (contents of sector plan)
To harmonize fisheries development with sustainable utilization of coastal resources.	To provide capacity building program for coastal resources management to establish fishing guideline based on scientific evidence and monitoring system of fishing activities.
To modernize fisheries activities and to make fishermen aware of self-reliant fisheries.	To provide modernization training program in order to foster self-reliant fishing groups [To make 10-20% of fishermen into core fishermen groups by the end of the 2nd short-term. (2007)]
To improve marketing system of fish products.	The model base construction program for concentration/sale of fish products and the base management training program. The transport system program of fish products from Eastern Region to Western Region. The installation program of model fish sale unit at consumer's markets in the Western Region.
To improve the infrastructure of fishing communities for the efficient and healthy fishing activities.	The equipment supply program to improve community infrastructure by village people's self-support efforts.
To support women's participation in the fishing activities.	The training program to foster the core active women's groups [one group per community by the end of the 2nd. short-term. (2007)]
To activate fishermen organizations.	The training programs centered to joint fish shipment to activate fishermen's association.
To promote fisheries credit projects to foster self-reliant fisheries.	The fisheries credit program for the core fishermen groups fostered by "b. modernization training program".

1.3.2 Development by Zone

As the north coastal line extends to the length of 680km from the west to the east, the coast has been divided into the following development regions/areas.

(1) Region division

The north coast has been divided into two Development Regions of west to east since their fisheries environments are different each other as shown in the following table.

Therefore the plan should be paid attention to the difference of development contents and priority for the Regions.

	Western Region <1	Eastern Region <1
i) Commercialization degree of artisanal fisheries	Developed partially	Not developed except seasonal processing of salted and dried fish
ii) Access to domestic and export markets	Dotted along main trunk road	Isolated from urban consumer's markets
iii) Social infrastructure	Basically sufficient	Not available
iv) Availability of coastal resources:		
-for domestic supply	Low availability	Available
-for export	Available	Available but low viability

Remark<1 : Western Region ; The coastal area of Cortes, Atlantida, and Colon Dept.
Eastern Region ; The coastal area of Gracias a Dios Dept.

(2) Area division

Western Region is divided into 4 Development Areas, and Eastern Region is into 2 Development Areas as shown in Fig 1.1. These Areas have no geographic continuity. The area characteristics are shown in the following table:

	Western Region (Area)				Eastern Region (Area)	
	Omoa	Tela	La Ceiba	Trujillo	B. Laguna	P. Lempira
Department	Cortes	Atlantida	Atlantida	Colon	G. a Dios	G. a Dios
Range of continental shelf (n.m.)	<5	<20	<20	<20	<20	>50
Access to SPS, the large consumption area (km)	60	90	180	340	100 n.m. (to Trujillo)	160 n.m. (to Trujillo)
Access to Olancho, the inland area	None	None	None	+	None	None
Major transportation to neighboring areas	Vehicles	Vehicles	Vehicles	Vehicles	Ships/ Airplanes	Ships/ Airplanes
Related projects	None	None	+<1	+<1	None	None

Remark<1 : "Project for modernization of the small-scale fisheries" ; Japan will have provided the training center/equipment as the grant aid by August 1998.

1.3.3 Stagle-wise Development

This master plan covers wide-ranged area and contents of various fields. In addition, as for the development programs relating to activation of fishermen's organization and

fisheries modernization, it is necessary to take experimental procedure such as a model project implementation. Therefore, the plan will have a stage-wised development method from following view point so that the allocation of time and fund goes well.

(1) Order of development by Region level

The development of Western Region precedes that of Eastern Region. The reasons are as follows:

- Better infrastructure conditions of Western Region makes the development easier.
- The related project will be preceded at Trujillo Area/La Ceiba Area in Western Region.
- Before the fisheries development of Eastern Region, it is necessary to improve fish marketing system in Western Region.

(2) Order of development among sector plans

- The programs which can generate income have priority among sector plans.
- Before the implementation of credit programs, the program of fishermen modernization training needs to be carried out.

1.3.4 Method of development cost saving

Much amount of direct benefit could not be expected by the sector plan of "artisanal fisheries modernization" and "fish marketing improvement". In addition, the social benefit is not easily counted as in the figures of direct benefits, although the plans such as capacity building for coastal resources management, improvement of infrastructure in fishing communities, women's participation, and so on have great social benefit to the coastal fishing communities. Therefore, it is necessary to save the development cost in order to raise the feasibility of the master plan. The following methods for of development cost saving will be taken in this plan:

(1) Common use method of facilities/equipment

In stead of providing separate facilities/equipment for each sector plan, they will be used commonly to the extent they can

(2) Cost sharing method by beneficiaries

In case of a sector plan which can generate some direct benefits, those who will enjoy the benefit may share a part of development cost of this plan.

2. Sector Plans

2.1 Plan of Capacity Building for Coastal Resources Management

2.1.1 Objectives

In order to achieve sustainable use of fisheries resources in the north coast, it is necessary for the government to grasp current resources conditions scientifically, and based on that, to make resources management policies and fish production guideline which could be acceptable by fishermen side.

Taking into consideration current limited performance on resources management by DIGEPESCA, following targets have been set up by this sector plan which requires the support of foreign technical assistance.

a) To accumulate biological information of main target fishes for fishing through surveys on resources conditions and water body characteristics of the main fishing grounds.

b) To train technical staff of DIGEPESCA and build up their capacity of policy making on resources management through survey works described in a).

c) To establish proper information collection system of fisheries activities.

d) To promote education to fishermen / fishermen organization relating to sustainable use of fisheries resources.

2.1.2 Contents of the plan

(1) Plan period : About 5 years period in the initial stage of the master plan.

(2) Objective area : The central office of DIGEPESCA, and main fishing grounds in the north coast.

(3) Contents of activities : See the table below.

Activities	1 st Short-term Period					Objective Division in DIGEPESCA
	1 st	2 nd	3 rd	4 th	5 th	
1. Accumulation of Biological Information of Main Target Fishes						
1) Ecological information such as spawning, migration, etc.						Research / Technical Dept.
2) Resources survey on main target fishes						- ditto -
3) Survey on characteristics of current fishing method ; selection of proper method						- ditto -
4) Data base of fisheries / ecology of main target fishes						- ditto -
5) Staff training						- ditto -
2. Capacity Building for Policy Making on Resources Management						
1) Guideline of fish production to main target fishes						Planing/Develop. Dept. Research/Tech. Dept
2) Communication of system among domestic research agencies						- ditto -
3) Resource management committee including members from fishery companies						- ditto -
4) Staff training						- ditto -
3. Establishment of Information Collection System of Fisheries						
1) Format for statistical data collection						Office of Statistics
2) Manual of statistical survey						- ditto -
3) Staff training						- ditto -
4. Fishermen Organization / Communities						
1) Review of fishermen registration system						Marine Fisheries Dept. & Monitoring / Control Dept.
2) Survey on illegal fishing and review of fishing regulations						- ditto -
3) Enlightenment of fishermen's consciousness on resources management						- ditto -
4) Staff training						- ditto -

2.1.3 Implementation System

(1) Central level

DIGEPESCA needs to obtain the foreign technical support to implement this sector plan. Also it should set up the "Execution Committee of Resource Management Plan (tentative name)", and decide the project implementation policy by obtaining advice of foreign experts.

The Execution committee consists of representatives of Planning/Development Dept., Statistical Office, Research/Technical Dept., Marine Fisheries Dept. and Monitoring/Control Dept., and try to make a consensus on policies and strategies of resources management among members. Especially, data analysis works are required high level of professional knowledge, therefore the committee should establish a network with research institutes centered on UNAH in order to secure the support of men of learning and experience.

The committee should also establish a cooperation system by Area level for surveys related to resources management requesting the participation of fisheries companies, municipalities and fishermen organizations coordinated by the Area training center.

At least, one full-time counterpart and one part-time senior counterpart are to be appointed to foreign experts since this coastal resources survey will take long time period.

(2) Regional level

Each Area training center functions as a coordination body at Area level, and is responsible for smooth implementation of the project and for monitoring the project activities.

2.1.4 Planned Facilities And Equipment

The most important activity of this sector plan is the resources survey and the water body characteristics survey at main fishing grounds. The survey team will collect samples on the sea and analyze them at on-land facilities.

Required facilities and equipment for these works are as follows:

Facilities

Wet lab.: To be provided at following areas,

Western Region: Omoa and Trujillo

Eastern Region: Brus Laguna

Equipment

Research vessel :

- 100 HP FRP boat ; loading capacity of 2t, installed with marine survey equipment, fishing gear, simple water analysis apparatus, etc.

Wet lab. equipment :

- Balance, ruler, magnifier, dissection apparatus, etc.
- Office equipment

2.2 Plan of Small-Scale Fisheries Modernization

(1) Objectives

- To foster core fishermen through education/training to plant in them senses of self-reliable fishing and sustainable utilization of coastal resources.
- To establish fish production structure by grouped fishermen lead by core fishermen in order to supply anticipated deficient amount of fish in the north coast at the end of the 2nd short- term period (the mid of 2008).

(2) Objective area and objective fishermen

The Objective area of this plan covers all of the north coast. The objective fishermen are as follows:

- Western Region: Fishermen registered to the government in the period of 1996 (about 2240 persons).
- Eastern Region: Fishermen who sold fish products (about 3114 persons), clarified by the result of "Fisheries Census Survey in the Eastern Region (La Mosquitoes) in 1996".

(3) Plan period

Ten (10) years covering the 1st and the 2nd short-term period out of the overall plan period.

(4) Plan contents

1) Training program for fisheries modernization

i) Implementation of basic training program

- To implement following training:
  - Fishing technology by motorized boat
  - Quality control technology using ice

- Recording technology of fish catch
- Maintenance/repair technology of engines and fishing gears
- Management technology of fishing activities

- To select candidate fishermen expected to be core fishermen for fisheries modernization, through evaluation of the training result.

ii) Selection procedure of core fishermen groups

- To lend modernized fish production means (motorized boat, fishing gears, etc.) to fishermen groups composed by three members per one group, each group of which in organized by each candidate of core fishermen selected by above-mentioned basic training program.
- To select core fishermen groups within one year based on the every 3 months evaluation results obtained from the procedures of repeated monitoring and advising on manners and achievement of fishing management conducted by fishermen groups organized by candidates of core fishermen.

iii) Establishment of fish production structure by core fishermen groups

The core fishermen group will receive fishing training by using modernized fish production means lent by this project, and produce fish under following planning fishing conditions.

Condition 1. Target of annual production increase per planned boat

			Western Region	Eastern Region
Annual fish catch/boat	- Planned	(lb/boat/yr)<1	12,000	21,600
	- Current		5,700<2	1,500<3
Planned production increase		(lb/boat/yr)	6,300	20,100
		(kg/boat/yr)	2,860	9,134

Remarks <1: Western Region: Hearing survey results on fish production in 1996 from the MODERPESCA fishermen group (average of 10 samples out of 12 samples excluded the minimum and maximum figures).

Eastern Region: Three times of average annual catch per boat at Patuca and Barrita which are main fishing ground, based on the 1996 census result.

<2: Calculated from results of Artisanal Fisheries Survey by PRADPESCA in 1995.

<3: Average annual fish catch by non-motorized boats based on the 1996 census result.

Condition 2. Planned fishing schedule by region

Western Region

- Fishing by 25HP Boat

Number of Fishermen per Boat		3		
Number of Trips			Fish Catch	
(weeks/year)	(trips/week)	(trips/year)	(lbs/trip)	(lbs/year)
45	3	135	89	12,015

- Annual Income by Fish Sales per Boat

	Hand Line	Gill Net	Total
Share of Fish Catch	70%	30%	100%
Number of Trips	95	40	135
Fish Catch (lb/year)	8,410	3,605	12,015
Unit Price (US$/lb)	0.821	0.583	
Amount of Sales(US$/year)	6,905	2,102	9,007<1

Remarks <1: Annual net profit is shown in Table 2.2.1.

Eastern Region

- Fishing by 15HP Boat

Number of Fishermen per Boat		3		
Number of Trips			Fish Catch	
(weeks/year)	(trips/week)	(trips/year)	(lbs/trip)	(lbs/year)
45	4	180	120	21,600

- Annual Income by Fish Sales per Boat

	Hand Line	Gill Net	Total
Share of Fish Catch	50%	50%	100%
Number of Trips	90	90	180
Fish Catch (lb/yr)	10,800	10,800	21,600
Unit Price (US$/lb)	0.349	0.238	
Amount of Sales(US$/yr)	3,769	2,570	6,339<1

Remarks <1: Annual net profit is shown in Table 2.2.2.

Condition 3. Target production increase and required number of modernized boats in the end of 2nd short-term period (2007).

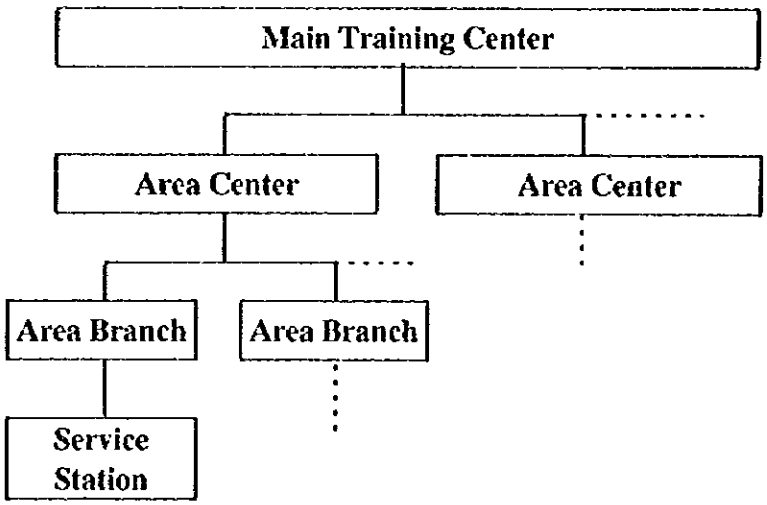
	West Region	East Region	Total
- Target production increased (t/yr.)<1	640	817	1,457
- Consumption within Region (t/yr)	640	466	1,106
- Outflow from Region (t/yr)	-232<3	232<3	0
- Export (t/yr)	232<3	119	351<2
- Required No. of boat	224	90	314

Remarks <1: Details are explained in Table 2.2.3
<2: Assumed 2 times of export volume without project (175.5 t/yr)
<3: Planned to supplement exported volume by fish from Eastern Region

2) Planned functions of training facilities and their locations

i) Kinds and functions of training facilities

Four (4) kinds of training facilities are to be provided in the following organizational structure:



Basic functions of each facilities are as follows:

a. Main Training Center (MTC)

- To be the core training facilities in this plan, and located in the Trujillo area.
- To provide all the necessary facilities/equipment for the basic training programs and assign full-time trainers.
- To evaluate overall training activities through collecting and analyzing

relevant information from the Area Center

- To train trainers of the Area Center to upgrade their technology level

b. Area Center

- To be a subordinate organ directly instructed by MTC.
- To provide full time trainers trained at MTC.
- To provide facilities/equipment necessary for fishing training and other training required repeating practices.
- To collect information on progress of training activities and fish production by fishermen by the training program.
- To engage in an itinerating training to its subordinate organs, Area Branches and Service Stations.

c. Area Branch

- To have a branch function of the Area Center without full-time trainers.
- To provide sufficient space and equipment enough to carry out an itinerating training of more or less once a week

d. Service Station

- To be facilitated as such a place that fishing training and its monitoring are more focused on among menu of the training programs.
- To be controlled by the Area Branch or directly by the Area Center.

These training facilities will have functions not only for fishermen training programs but for programs of fishermen organization support, community women support, etc., covered by this Master Plan.

ii) Locations of training facilities/equipment

Planned location of each training facilities by Area zone are shown in the Table 2.2.4, and the number of training boats/years in Table 2.2.5.

(5) Implementation method

The north coast is divided into two (2) development zones (the Western Region and the Eastern Region), with different degree of difficulty for development and with different characteristics of fishing resources. Accordingly the plan of small-scale fisheries modernization will take following stage plans:

First Stage (implemented by another related project)
In response to positive results of "the Trujillo MODERPESCA Project" conducted during 1991-1994, the MTC and two (2) Area Branches will be newly established in Trujillo, Santa Rosa de Aguan and Limon, respectively, in order to commence the modernization training programs in a full-scale. At the same time, the La Ceiba Area Center will be also established expecting horizontal expansion of the project effect (this first stage project will be completed by the grant-based assistance of the Government of Japan by August, 1998). Utilization of these facilities will be taken into account in the overall development concept of this master plan, but these facilities plan will not be included. The personnel plan will be included in this master plan.

Second Stage (The latter half of the 1st short-term period)
To proceed more horizontal expansion of training activities, both of Tela and Omoa Area Centers and their Area Branches at Tornabe and Baja Mar will be established, respectively, after evaluating the implementation results of the First Stage training programs. The Area Branch at Nueva Armenia in La Ceiba Area will also be established, which was excluded in the First Stage plan.

On the other hand, in order to commence modernization of artisanal fisheries in the Eastern Region as soon as possible, the Brus Laguna Area Center will be established because this Area is nearer to the Western Region compared with the Puerto Lempira Area.

Third Stage (The former half of the 2nd short-term period)
After evaluating the training implementation at the Brus Laguna Area Center, the Puerto Lempira Area Center which has the most disadvantageous development conditions, will be finally established. At the same time, both of Batalla and Cruta Area Branches will be also established. (By the end of the Third Stage, all of planned Area Centers and Area Branches will be established.)

Fourth Stage (The latter half of the 2nd short-term period)
All of the Service Station in each Area will be established (six stations at Masca, Miami, El Triunfo, El Provenir, Patuca, and Barrita).

(6) Implementation schedule

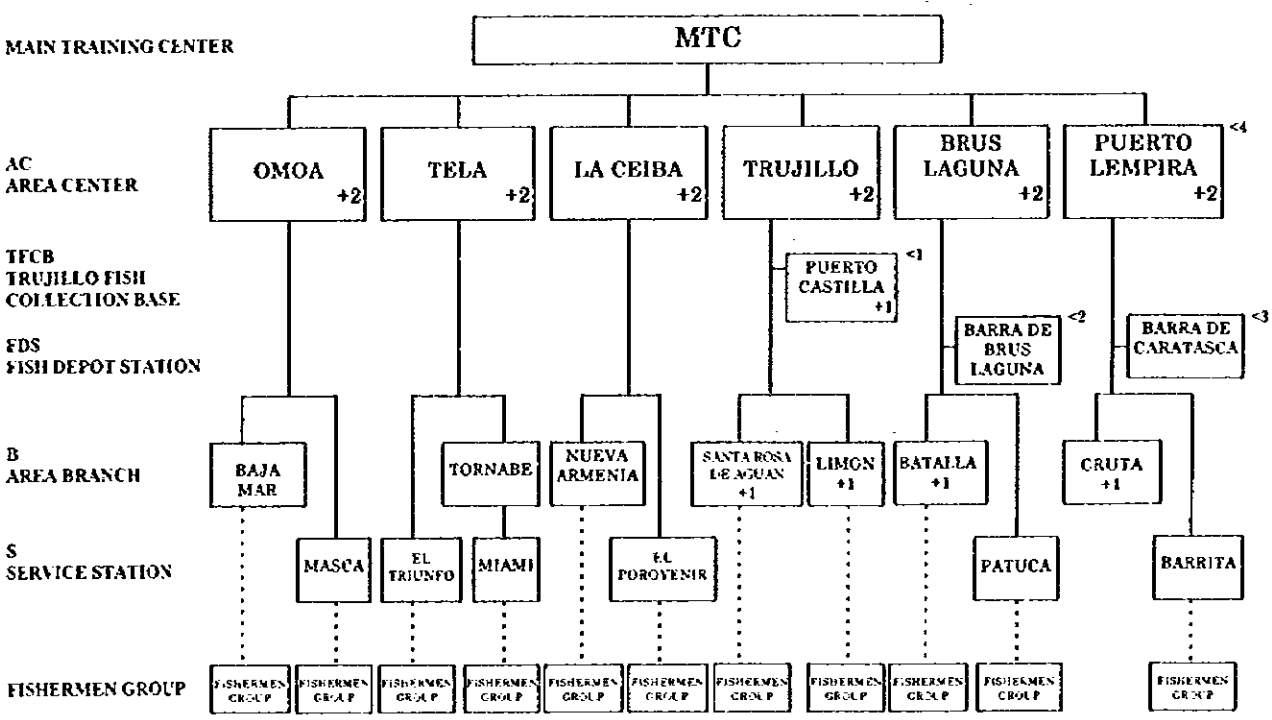
Development Stage	1997	1st short-term (Jun/1998~)	2nd short-term (Jun/2003~)	3rd short-term (Jan/2008)
First Stage	▨ <1	△ <2		
Second Stage		□ △		
Third Stage			□ △	
Fourth Stage			□	

Remarks: <1: ▨ Implemented by Japanese grant separately from this master plan.

<2: △ Project evaluation in each stage

(7) Organization of the plan operation

DIGEDESCA will operate this plan, and is responsible for its necessary budget arrangement. It would be necessary to get the technical assistance by foreign experts in order to upgrade the technical level of DIGEPESCA staff of Area Centers by the end of the 1st short-term period. The operation organization is shown in the figure below:



Remarks <1: Trujillo Fish Collection Base at Puerto Castilla, explained in 2.3

<2: Affiliated fish depot of Brus Laguna Area Center located at Barra de Brus

<3: Affiliated fish depot of P. Lampira Area Center located at Barra de Caratasca

<4: Figures in boxes shown necessary numbers of new trainers

All the Area Centers will be established inside/near the sites of existing DIGEPESCA regional offices or Inspector-ship offices. Accordingly, the DIGEPESCA staff will principally serve concurrently ordinary office works of this training programs. However, each Area Center should have two (2) newly designated trainers on fishing operation and mechanic.

The training in the Area Branch and the Service Station will be carried out on the basis of an itinerating training system. However, both Area Branches of Santa Rosa de Aguan and Limon in the Western Region will have one (1) full-time trainer of fishing operation, respectively, in order to make sure to attain the objectives in the first stage plan. One (1) full-time trainer is assigned to the Trujillo Fish Collection Base (explained in 2.3 "Plan of Fish Marketing Improvement") established in Puerto Castilla, and conduct fish collection/sales service and a training program of joint (or cooperative) fish shipment by fishermen organization. In the cases of Batalla and Cruta Area Branches in the Eastern Region, each one of full-time fishing operation trainer is to be assigned because of difficulties of periodical trips for an itinerating training. Consequently seventeen (17)trainers in total should be newly assigned in this sector plan.

(8) Method of operation and maintenance

DIGEPESCA is principally responsible for the budget arrangement of operation and maintenance cost of this training plan. The main cost items are as follows:

- Personnel cost for newly assigned trainers
- Fuel cost for itinerating training
- Travel cost for external staff
- Repair cost for training facilities
- Renewal/repair cost for training equipment

Among the training equipment, sets of fishing training equipment (FRP boat, outboard engine, fishing gear, ice box, etc.) are lent to a large number of core fishermen groups. The lives of these equipment except FRP boats are short (3~5 years), and their renewal/repair cost are much burden to DIGEPESCA. Instead of DIGEPESCA, fishermen groups should be burdened with this type of cost from view point of the principal objective of this plan fostering self-reliant fishermen. Therefore, it should be examined that they are burdened with following cost shares in order to convert

fishermen's consciousness from subsistence level to self-reliant level.

- Pertical sharing of personnel cost for newly assigned trainers
- Pertial sharing of fuel cost for itinerating training
- Partial sharing out of total procurement cost of fishing training boat/equipment

Such cost sharing plays a role of training for upgrading management capability of fishermen, and lead to future realization of financially viable operation of fishermen organization by themselves.

Following table shows examples of cost sharing by a fishermen group out of the operation and maintenance cost of this plan.

		Per Fishermen Group	
		Western Region	Eastern Region
A	Fish catch sales amount (U$/boat/yr.)	9,007	6,339
B1	Share 1. (Depreciation of fishing training equipment set) (U$/boat/yr.)	1,237	976
B2	Percentage out of Sales Amount (%)	(13.7)	(15.4)
C1	Share 2. (Personnel cost of new trainers) (U$/boat/yr.)	162	162
C2	Percentage out of Sales Amount (%)	(1.8)	(1.8)
D1	Share 3.(Fuel cost of itinerating training) (U$/boat/yr.)	12	12
D2	Percentage out of Sales Amount (%)	(0.1)	(0.1)
E1	Share 4. (Partial share of total project cost for procurement of fishing training equipment set) (U$/boat/yr.)	305	130
E2	Percentage out of Sale Amount (%)	(3.4)	(2.0)
Totals in case of share 1~4 (U$/boat/yr.)		1,716	1,280
Total percentage out of Sales Amount (%)		(19.0)	(20.2)

On the other hand, it is necessary to provide the initial operation capital 8the cost for fuel, ice, food, etc.) for the fishing operation training to the fishermen by using modernized small-scale boat. The operation expense required for the first one month is estimated at about US$180/boat [see table 2.2.1(3)] . Once this initial expense is budgeted by the government, it will enable this training program commence smoothly. And, by selling the fish catch during this training program, further operation capital for the training will be continuously generated.

2.3 Plan of Fish Marketing Improvement

This sector plan consists of following three (3) sub-plans

- Plan of "Trujillo Fish Collection Base" development
- Plan of fish marketing improvement in the Eastern Region
- Plan of fresh fish marketing improvement in the coastal consumers' markets

2.3.1 Plan of "Trujillo Fish Collection Base" development

(1) Objective

- To develop a model of fish collections base in Trujillo Area (hereinafter referred to as "TFCB") in order to establish fair trading system between fishermen and fish traders.
- To develop a marketing system of fish products shipped from the Eastern Region.
- To train fishermen organization members to let them conduct joint fish shipment using planned facilities.

(2) Objective area

Coastal area nearby Puerto Castilla in the Trujillo Area.

(3) Period

The 2nd short-term in the Master Plan period.

(4) Plan contents

1) Activities of TFCB

(i) Organizing activities to introduce buy/sell system of fish in order to give advantages to fishermen

Final target of the activities is to establish a market oriented fair trading system of fish as a model of fish marketing in the north coast. It will require much efforts and time to coordinate opinions between fishermen and fish traders.

Following activities will be conducted step by step:

- To organize core fishermen groups in Trujillo area to land their fish catch to TFCB.
- To classify and store their fish catch in good condition.
- To inform fish types and volume of fish landings to fish traders.
- To invite plural number of fish traders and let them check fish.

- To let them offer fish price, and sell fish after setting the final price through negotiation based on offered selling price from fishermen side.

As for fresh fish which satisfies export condition, a commission system of charging about 5% will be established.

(ii) Marketing of fish shipped from the Eastern Region

This is the key activities of TFCB to enable the Eastern Region fisheries to convert into a year-round base (see section 2.3.2). Following are main work contents:

- To establish stable marketing system for fish volume of two (2) tons at a time (The loading capacity of the transport vessel is 8 gross tons).
- To establish accurate scheduling system between fish sales activities at TFCB and fish shipment from Eastern Region.
- To support material procurement for transport vessels such as fuel, fishing gear, etc.
- To maintain transport vessels.

(iii) Operation training to fishermen organization members

- To train members how to manage cooperative fish sales activities using planned facilities. The objective fishermen organization is not only the one of Trujillo Area but also those covered by Area Branches/Service Stations. The purpose of this training has vision of making those organizations as agencies for operation and maintenance of these training facilities.

2) Peak volume of daily fish handling

Estimated peak volume is as follows:

- By core fishermen groups: 1.3 tons/day
- By transport vessel: 2.0 tons/day

Total 3.3 tons/day

3) Facilities and equipment

- Landing facilities for 2 tons loading transport vessel
- Fish handling hall with fish storage, ice making machine and offices
- Full supply tank
- Equipment for fish handling and office wok

- transport vehicle, etc.

(5) Implementation schedule

Activity	1st Short-term	2nd Short-term	3rd Short-term
a. Staff training			
b. Construction of facilities			
c. Operation 1			
-Sales of fish by core fishermen grp.			
-Sales of fish by transport vessel			
-Training of fishermen organization			
d. Operation 2			
- Lease to fishermen organization			

Remarks: [ ] operated by DIGEPESCA

[ ] ; continued by fishermen organization

(6) Operation system

A newly recruited staff will manage the operation of TFCB. He will receive a managerial training for 3-4 years from a foreign expert of fish marketing appointed by DIGEPESCA.

2.3.2 Plan of fish marketing improvement in the Eastern Region

(1) Objective

To establish periodical shipment system of fish products by fishermen themselves from the Eastern Region to TFCB in the Western Region in order to convert current seasonal fishing activities to year-round ones (see Fig. 2.3.2).

(2) Objective area

Both of the Brus Laguna and Puerto Lempiru Area Centers are the bases of fish shipment. Qualified fish for shipment will be collected from these covering areas even from Area Branch/Service Stations..

(3) Period

The 2nd Short-term in the Master Plan period.

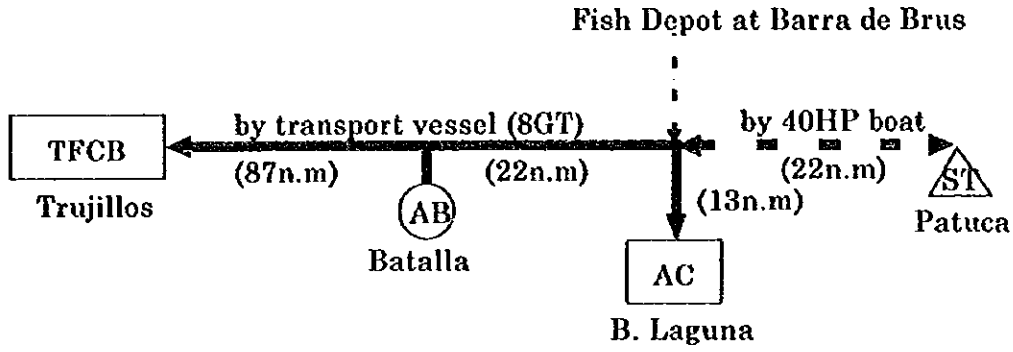
(4) Plan contents

1) Shipment network system

a. Case of the Brus Laguna Area

- To connect between TFCB and the B. Laguna Area Center by one (1) transport vessel of 8 gross tonnage (100HP).
- To connect between the Area Center and Patuca Service Station by one transport boat (40HP) with 500kgs loading capacity.

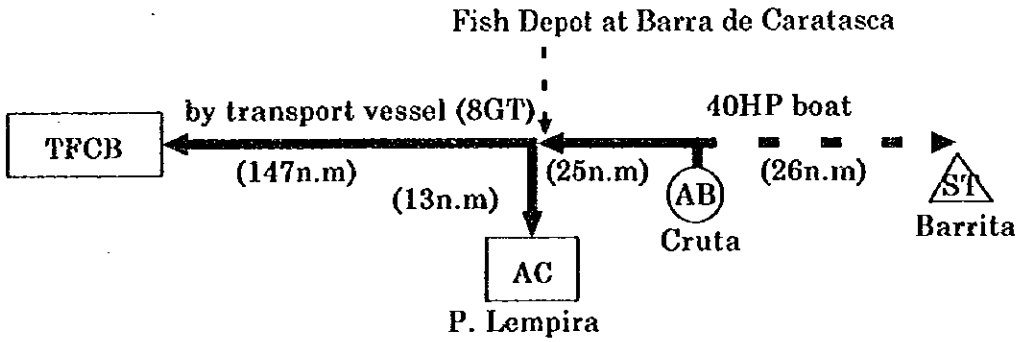
The network is shown as follows:



b. Case of the Puerto Lempira Area

- To connect between TFCB, the P. Lempira Area Center and Cruta Area Branch by one (1) transport vessel of 8 gross tonnage's (100HP).
- To connect between the Cruta Area Branch and the Barrita Service Station by one small transport boat(40HP) with two 500kg capacity

The network is shown as follows:



2) Shipment schedule of transport vessel

(i) Staff of transport vessels

- 8 GT Transport vessel : by 3 persons (captain, chief engineer and a clue)

- 40HP transport boat : by fishermen themselves

(ii) Volume and schedule of shipment

a. Shipment volume by Area

	Development Area		Total
	B. Lagna	P. Lempira	
- Planned production increase (t/yr.)	263	554	817<1
- For Area consumption (t/yr.)	123	258	381
- Shipment to Western Region (t/yr.)	140	296	436

Remarks <1: See Table 2.3.1

b. Maximum and break even annual trips of shipment to TFCB

Annual Shipment<1	Area Center	
	B. Laguna	P. Lampira
- Case of maximum (trip/yr.)	70	90<2
Shipment volume (t/yr.)	(140)	(180)
- Case of break-even (trip/yr.)	43	60
Shipment volume (t/yr.)	(86)	(120)

Remarks <1: See details in Table 2.3.2
<2: Assumed based on navigation time spent between both sites

On the other hand, it is necessary to provide the initial operation capital (the cost for fish purchase, ice, fuel for transportation and for sales, etc.) for fish shipment by planned transportation vessels. The operation expense required for the trip of the first shipment (back and for) is estimated at about US$3,400/vessel (see Table 2.3.2). Once this initial expense is budgeted by the government, it will enable the shipment activities to operate continuously. In future, even when fishermen organization will engage in the agent works of fish shipment, its financial in dependence would be secured.

In case of the B. Laguna Area Center, at least 43 trips (86 tons) of shipment should be conducted. If further trips are conducted transport profit could be expected at the rate of approx. US$720/trip. Private traders also will have their business chance by shipping fish within the balance of 140 tons to 86 tons (54 tons), annually.

In case of the P. Lempira Area Center, at least 60 trips of shipment should be conducted. If further trips up to 90 trips are conducted, transport profit could be

expected at the rate of approx. US$520/trip. As described in annually 296 tons of fish should be shipped from this Area zone.

Accordingly, private traders in P. Lempira Area will have their business chance by shipping fish within the balance of 296 tons to 180 tons (116 tons), annually.

(iii) Volume of fuel shipment from TFCB to the Eastern Region

The fuel price in the Eastern Region is at least 20% higher than the price in the Western Region. On the return trip of fish shipment from TFCB, the transport vessel will transport required volume of fuel/lubricant for fishing activities by planned training boats.

In each trip, approximately 10 drums of fuel and 22 gallons of lubricant should be shipped. And annually 60 trips should be engaged for this shipment. This number of trips is much less than the number of annual trips to cover break even trips of two transport vessels.

(5) Operation system

The final target of this plan is to establish fish transport system by fishermen organization. However, in the initial stage of this plan implementation, they need training relevant to overall management (planning, scheduling, money handling coordination among agencies, etc.). Accordingly, each Area Center will take responsibilities of this fish shipment operation under coordination with TFCB by the end of the 2nd short-term period.

(6) Balance of revenues and expenses of the vessel operation

The annual balance of revenues and expenses at max. number of trips in each Area Center is as follows:

Unit: US$/yr.

	B. Laguna	P. Lempira
a. Revenues	72,072	92,664
b. Expenses		
- Operation cost	30,634	55,190
- Maintenance cost	11,000	11,000
- Interest	-	-
- Depreciation	11,000	11,000
c. Income	19,438	15,474

2.3.3 Improvement Plan of Fresh Fish Sales Method in Consumer's Markets

(1) Objective

Most of existing consumer's markets are designed as an agricultural product market. Fish is being sold in unsanitary and bad looking conditions. The objective of this plan is to stimulate the coastal people to consume more fish through providing samples of sanitary and better looking fish sales units in the coastal consumer's markets.

(2) Objective area

Trujillo, La Ceiba, Tela, Omoa Areas in the Western Region

(3) Period

During the 2nd Short-term of the Master Plan period

(4) Plan contents

1) Activities

To provide following two types of fish sales units:

a. Fixed-type unit to be installed inside consumer's markets
b. Mobile type unit to be kept at the Area Center and to be used by core women groups

2) No. of the unit

- Trujillo Area : One (1) set
- La Ceiba Area: Two (2) sets
- Tela Area : Two (2) sets
- Omoa Area : Three (3) sets

(5) Implementation method

Under the guidance of the Implementation Committee of the Small-scale Fisheries Development, each Area Center will discuss with representatives of the relevant city administration on the target market and utilization method of the fixed fish sales unit. After the committee confirmed the discussion result, the unit will be installed. The Area Center will monitor and evaluate the effectiveness of both type of units, and report too the committee.

(6) Implementation schedule

This plan will be implemented according to the schedule shown below.

Activities	1st Short-term	2nd Short-term	3rd Short-term
a. Preparation by the Coordi. Committee		■	
b. Planning among the Area Center and the city administration		■	
c. Confirmation by the Committee		■	
d. Installation of the unit		■	
e. Training of fish handling		△	
f. Monitoring/evaluation		■	<1
g. Report to the Committee			△

Remarks <1: Continuous fresh fish sales on the self-reliant basis by using the sales units.

(7) Operation and maintenance

Each Area Center will be responsible for this operation and maintenance under the guidance of the Coordination Committee. Fixed sales unit will be maintained by the City Administration.

2.4 Plan of Fishing Community Infrastructure Improvement

(1) Objective

- To improve fishing community infrastructure within the scope of maintaining minimum healthy lives of community people and for contributing to upgrade the efficiency of fishing activities.
- To foster the spirit of self-government and mutual assistance among community people through the implementation of this plan.

(2) Objective community

The objective community covers all fishing communities long the north coast. This plan puts priority on the support of the Eastern Region where the social infrastructure provision by the government in substantially delayed.

(3) Period

The 2nd Short-term of the Master Plan period.

(4) **Plan contents**

1) Contents of infrastructure improvement

(i) Improvement for contributing to upgrading the efficiency of fishing activities

- Construction/repair of bridges and roads to connect community with landing sites.
- Construction of wooden jetty at landing site (limited only inside lagoons).
- Cleaning canals passing to rivers and sea (removal of fallen trees)
- Improvement of roads connecting to other communities (for transport of fish products).

(ii) Improvement for contributing to healthy lives

- Installation of a shallow well with a manual pump.
- Improvement of drainage ditches.
- Installation of communication equipment for an emergency case.

2) Implementing method

Most contents of improvement items could be handled by community people themselves if working equipment and/or construction material are available. The basic principle of this plan is only to provide necessary equipment which will be lent to the community for cooperative works being decided improvement items by the people themselves. Necessary materials would be provided together with technical advice by relevant engineers in the cases of shallow well installation, wooden jetty construction, etc.,

3) Examples of supporting equipment and materials

a. Machinery and tools

Basically limited only to hand operated equipment:

- For maintenance works of roads, canals, drainage, etc.;
  Single wheel cart, concrete mixing tools, power saw, scoop, etc.
- For construction of buildings, wooden jetty, etc.;
  Carpentry tools set
- For installation of shallow well;
  Excavation tool set, plumbing work set, etc.
- For emergency call;
  Solar battery type radio set

b.Materials

Basically limited only to materials which are not easily available in nearby area

- For maintenance works of roads, canals, drainage, etc.;
  Wires, polyethylene pipe, nylon rope, etc.
- For construction of buildings, wooden jetty, etc.;
  Nails, bolts, galvanized iron sheet, bomber, etc.
- For installation of shallow well;
  PVC pipes, faucet, hand pump, etc.

(5) Implementation schedule

The preparation will take much time prior to the execution of improvement works by the community people. The schedule in as follows:

Activities	1st Short-term	2nd Short-term	3rd Short-term
a. Needs identification	.....		
b. Execution		▬▬▬	

Remarks: ..... Preparation, ▬▬▬ Implementation

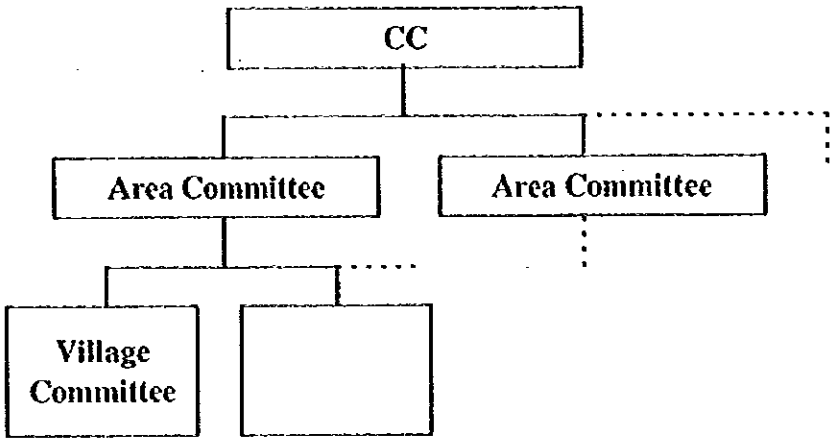
(6) Operation/maintenance system

1) Overall operation system of this plan

- Overall operation of this plan will be controlled by "Coordination Committee of Small-scale Fisheries Development in the North Coast" (herein-after referred to "CC", See III.4 OPERATION AND MAINTENANCE PLAN) established in DIGEPESCA. Prior to making necessary budget arrangement for the plan implementation, the CC should avoid duplication of similar activities by the Social Investment Fund (FHIS), the National Autonomous Water/Drainage Incorporation (SANA), etc.
- The Area Centers established by "Plan of Small-scale Fisheries Modernization" will store planned equipment/materials, and manage rental services of the equipment/material to the community.
- The CC should secure engineers temporarily for training of people on the installation of shallow well, radio, drainage ditches, etc.

2) Organization of implementation

This plan will be implemented based on the organization structure with three (3) levels as shown in below:



a. CC

- Committee members:
  See III.4.1
- Main role:
  To arrange necessary execution budget and control overall operation of this plan based on results of deliberation on the requested contents of infrastructure improvement prepared by the Area Committee

b. Area Committee

- Committee members:
  consists of representatives of the Area Center, relevant municipalities and fishing villages
- Main role:
  Based on the "Questionnaire on Infrastructure Improvement Request" provided by the CC, the Area Committee will examine the improvement request by village level, clarify unclear points and submit the draft of "Area Execution Plan" to the CC. This draft plan is examined, modified and finalized by the CC. After the confirmation of the "Area Execution Plan", the Area Committee will execute the Plan.

c. Village Committee

- Committee members:
  Consists of several Village people organized by the Area Committee
- Main role:
  Based on the "Questionnaire on Infrastructure Improvement Request", the

village request will be put together among the people. After the confirmation of the "Area Execution Plan", the committee will organize the village people and execute necessary cooperative works. The result is to be reported to the Area Committee.

2.5 Plan of Fisheries Community Women Support

(1) Objective of the support plan

Women in fishing villages located in the study area play an important role in mainly fish processing, sales (peddling), and in the care and maintenance of fishing gear; and they are a vital element in maintaining the socioeconomic structure of fishing villages. With the exception of a certain segment, the sole source of income is generated by fisheries. Therefore women in the village communities are generally interested in fisheries activities. Compounded by low or undeveloped infrastructure, they are also interested in sustaining and improving the life of fishing villages.

Although there are no social constraints that impede women from participating in fisheries activities, the clear gender role divisions, the lack of basic knowledge and skills, the lack of basic educational skills such as reading, writing and arithmetic, etc. and heavy burden of house works are factors that have hampered the participation of women in fishing activities.

Considering such circumstances, this sector plan will help women to become self-supporting and to promote their participation in fisheries activities through conducting education and training, and finally generates their fisheries income and creates a system to improve the living standards of the fishing communities by women themselves.

(2) Supporting strategy

1) Policy

(a) The assistance plan will focus on the mutual correlation between generating fisheries income and improving the living standards of the community.

(b) In order to help the women to become self-supporting, priority will be given to fostering women groups in fishing communities.

(c) Educational and training programs in fish processing and sales expected income generation will be prepared to help promote women groups in fishing communities. Prior to its implementation, a "trial program" will be carried

out by experts in order to verify the program's economic appropriateness.

(d) The support plan will be implemented by stage. The short-term stage will focus on fostering core women groups, the mid-term stage will aim to expand women groups in each fishing village, and the long-term objective will be to set up access to small-scale financing which will assist the self-supporting activities of women in fisheries and the fishing community.

2) Implementation method

(a) As measures to support community women, three (3) sub-plans are formulated to foster core women groups in the fishing communities, to provide training for income generation in the fisheries field, and to improve and disseminate living standards. The sub plans will provide various types of training programs.

(b) Prior to implementation of training programs, women who are active in raising the living standards in each fishing village are organized in groups. Various types of education/training will be conducted to these groups.

(c) This sector plan will target all fishing villages in the study area. It will be implemented in alignment with the construction schedule of the training facilities in the "Plan of Small-scale Fisheries Modernization" explained in section 2.2.

(d) A time period for implementing a "trial program" will be included, in order to ascertain economic viability of anticipated income generating programs such as producing cheap priced dried fish made from currently unutilized resources (small pelagic fishes, etc.) and selling to the people in the mountainous areas.

(3) Contents of the plan

The sub-plans under this sector plan will be comprised of the following training programs. The figure showing relation between sub-plans and training programs are shown in Fig. 2.5.1.

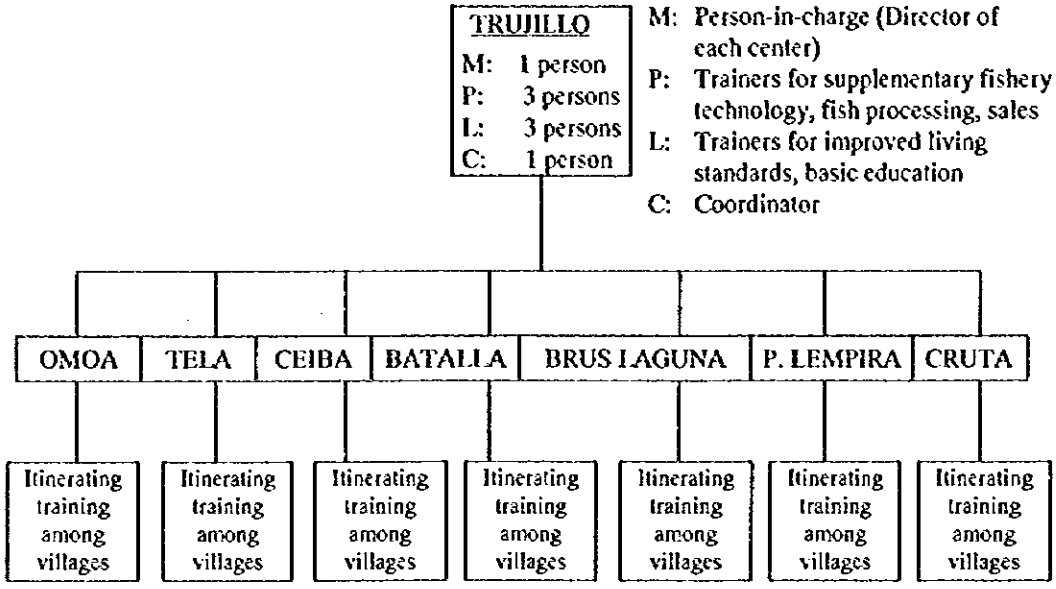
Sub-Plans	Training Programs
1. Foster women groups in fishing village communities.	• Organize and foster core women groups, and establish a base for their training. • Foster and propagate women groups in fishing villages.
2. Help generate fisheries related revenue (Support for income generation in fisheries field.)	• Supplementary technical guidance of fisheries related activities Guidance on fish processing and quality control of improved fish. • Guidance on fish sales
3. Improve and disseminate living standards	• Guidance on informal basic education • Guidance on simple vocational training • Guidance on improved nutrition and hygiene

The details of each training program are shown in Table 2.5.1(1)-(2). In addition, the implementation schedule of these programs according to each of the eight development Areas where they will be carried out, four in the Western Region (Trujillo, Ceiba, Tela, Omoa) and four in the Eastern Region (Batalla, Brus Laguna, Puerto Lempira, Cruta), are also shown in Table 2.5.2.

(4) Operational organization

The basic policy pertaining to the operational organization of this sector plan is outlined below.

1) This sector plan will be commenced after its implementation schedule and required budget are examined and arranged by the Coordination Committee set up in DIGEPESCA (described in III.4 "Operation/Maintenance Plan").
2) The facilities, equipment, and human resources provided by the "Plan of Small-scale Fisheries Modernization" explained in section 2.2, will be used jointly for those of the training programs in this sector plan.
3) The director of the Main Training Center will be concurrently in charge of overseeing each training program in this sector plan.
4) The facilities used for the training programs of this sector plan and trainers allocated in Trujillo Area are as shown below.



5) The same number of trainers in the Trujillo Area will be allocated as operating staff members to each of other training centers. The training for supplementary fisheries technology, fish processing and sales will be conducted by DIGEPESCA staff after completing their training at the Main Training Center and the Area Center.

6) The trainers who will be responsible for unofficial basic education, simple vocational training, and improved health and hygiene will implement the program with the assistance from the various branches of the Ministries of Agriculture and Livestock, Health, Education, etc.

7) Trainers who will be responsible for itinerating training will use motor vehicles and boats distributed to the Main Training Center and Area Centers.

(5) Credit program for community women support

Credit programs to help women participate to fisheries activities will be implemented based on the same approach explained later in section 2.7 "Plan of Small-scale Fisheries Credit". Following a target goal of ten years from the start of the training program for women groups in fishing villages, small-scale financing will be made available to those women groups which have completed the training program and whose potential for self-supporting economic activities has been recognized.

2.6 Plan of Fishermen Organization Improvement

2.6.1 Fishermen Organization Improvement Concept

(1) Objectives of the Plan

In the north coast, fishermen organizations are registered as fishermen associations. These organizations have been established not long ago, therefore they can not substantially carry out their role as a fishermen Organization because:

- They have not matured the spirit of cooperation and conciliation
- They do not have sufficient faculties to administrate the organization, to formulate entrepreneurial plans and to collectively carry out business.
- They are lacking in enough fund and facilities to administrate the organization.
- Their members have a low capability for fishing.

Within this sector Plan, the fishermen association is considered as the organization that represents the core role for promotion of artisanal fisheries in the north coast. This plan intends to carry out activities to foster and strengthen their association to realize such fishermen organization that could contribute to improvement of member's income level and life conditions..

(2) Policies of fostering fishermen organization

To foster the fishermen organization as an organization to enable members to cooperate and assist each others.

- To foster and strengthen economic activities and establish a financial base of the organization.
- To carry out welfare works for fishermen and their family by the surplus of their economical activities.
- To upgrade social trust of the organization through above mentioned activities , to be a window of artisanal fisheries credit system and to promote member's fisheries modernization.
- To strengthen the operation and management capacity of the organization, and in future to conduct agency works of a part of works burdened to DIGEPESCA derived from the implementation of the master plan.

(3) Objective fishermen organizations of the plan.

Area level fishermen organizations of the north coast.

(4) Methods and procedures of the plan

- The project goals are set up in each stage of 1st. short-term, 2nd. short-term and 3rd. short-term, taking into consideration the maturation level of fishermen organizations and the socioeconomic conditions in each Area Division.
- This sector plan is to be implemented by receiving the instruction and training given by experts specialized in organizing fishermen and administrating fishermen organization.
- Instruction and training will be provided to the staff of DIGEPESCA and the organizations, and its members.
- Training in fishing technique modernization to the members will be carried out by "2.2 Plan of Small-scale Fisheries Modernization ".

(5) Goal of the Plan

Based on the fostering policies mentioned above, the goals of the plan are set up as follows.

- 1st. Short-term : To set up foster and strengthen the organization system. (Construction and establishment of the organization's basis).
- 2nd. Short-term : To foster and strengthen the organization's economic works (Construction and establishment of the organization's financial basis).
- 3rd. Short-term : To foster member's welfare works, and to introduce a fisheries credit system (Improvement of member's welfare and establishment of self-reliant fisheries).

(6) Summary of the items to be improved

1) For setting up the organization system (1st. short-term)

- To clarify the organization's role and share of function, etc, within the region.
- To set up internal rules of the organization (such as bylaws for the execution of member's welfare and economic works).
- To set up the function within the organization. (set up of economic works committees, welfare works divisions, etc.).

- To employ and foster personnel necessary for the operation of the economic and the welfare works.
- To foster and strengthen the capacity of staff on operation / management activities.
- To foster members on cooperative and mutual assistance spirit, and to conduct education and publicity.

2) For fostering and strengthening of economic works (2nd. Short-term)
This will be carried out based in the following guidelines:

- Joint shipment works of member's fish products to be an essential economic works by the organization (hereinafter referred to "the joint shipment").
- To save the profit of the joint shipment , and to implement other economic works, self-imposed short-term credit works and member's welfare works (Table 2.6.1 shows the examples of profit generation by the joint shipment works of marine products, and Table 2.6.2 shows examples of profit distribution to other works).

The economic works that will be objectives of fostering and strengthening are indicated as follows. These works are introduced timely according to the maturation level of the organization.

- Joint shipment of fish products. (fresh fish/processed fish).
- Joint purchase/sale of fishing materials. (Fishing gears, fuels, inputs and other goods for daily use).
- Repairing workshop. (Maintenance and repair of outboard motors).
- Processing of marine products. (Salt dried fish, fillet, and other newly elaborated products).

3) Member's welfare works (3rd. short-term)
Implementation of welfare works are as important as the economic works for fostering the mutual assistance spirit among fishermen, at the same time for encouraging the incentives of fishermen to join the organization.

The origin of fund for welfare works comes from the members quotas, the special

reserves that are collected besides the normal quotas, the reserve from the joint shipment and donation from various fields. It is introduced and implemented according to the financial maturation of the organization. (reserved amount acquired by the quotas).

Examples of member's welfare works:

- Fund for assistance in case of disease, death and condolences.
- Compensation for disasters.
- School aid fund.

Table 2.6.3 shows the examples of the accumulation of fund for the welfare works.

4) Introduction of fisheries credit system (3rd. short-term)

It is introduced for artisanal fisheries to realize its modernization. Following two (2) kinds credit system will be implemented.

(a) Credit for small-scale fisheries modernization.

The initial fund for this credit system depends on the grant from the international aid organizations. This system will be utilized for the acquisition of modernized fish production equipment (boats, outboard motors, fishing gears). This activity will be carried out by the "Plan of small-scale Fisheries Credit" (See details in section 2.7).

(b) Credit for the short term operation

The system will function with its own funds from self-imposed reserve. Short-term operation fund and the funds for life improvement for the members will be financed. See details in section 2.6.2.

5) Agency service of operation / maintenance of the fish production / collection base (3rd. short-term).To conduct agency services of the operation / maintenance of TFCB and production bases of Area Branch / Service Station level in stead of DIGEPESCA itself (See details in section 2.3.1).

(7) Plan contents and implementation schedule

Implementation schedule by Area is shown in Table 2.6.4.

There might be changes of introduction and implementation of the economic works

according to the maturation level of the fishermen organization and the socioeconomic situation by Area zone.

1) Fishermen Organization in the Western Region

Among fishermen organizations in the north coast, Trujillo can be considered as the most advanced Area zone in terms of level of organization and modernization. In this plan the system and economic works of the fishermen organization in Trujillo will be set up, fostered and strengthened at first as a model for other Areas.

i) Project for the improvement of the fishermen organization in Trujillo Area.

1st. short-term goal : (1 to 5 years)

To set up its organization system and foster economic functions.

(a) Aspect of the organization system

- To set up the operation and maintenance system of the organization, and to foster administrative capabilities.
- To educate and foster the spirit of a cooperation and mutual assistance among members.
- To set up the administrative and management system of the economic works, and to train its staff and foster their works capacity.

(b) Aspect economic works

- To train and conduct joint shipment works of fish products
- To train the introduction of joint purchasing work of fishing materials

(c) Aspect of fisheries modernization of members.

- Implemented by "2.2 Plan of Small-scale Fisheries Modernization ".

2nd. short-term goal: (6 to 10 years)

To establish its financial basis through strengthening and expanding the economic works.

(a) Aspect of organization system

- To strengthen the operation and management system of the economic works.

(b) Aspect of economical works

- To strengthen and enhance the joint shipment of fish products.
- To carry out the purchasing works of fishing materials.
- To carry out training for the repair workshop works.

(c) Aspect of welfare works

- To set up the welfare system for members such as a presence of money of disease, disaster, etc.

(d) Agency works of operation / maintenance of TFCB.

- To carry out agency works of TFCB by the fishermen organization.

(e) Fisheries credit works

- To set up internal rules of fisheries credit works, and to carry out the implementation training.

3rd. short-term goal: (11 to 15 years)

- To stabilize the financial basis through expansion of the economic works.
- To strive for member's in modernization through implementing fisheries and further enriching welfare works.

(a) Aspect of Organization system

- To strengthen the operation and maintenance system for the welfare and fisheries credit works.

(b) Aspect of fisheries credit

- To carry out fisheries credit works

ii) Fishermen organization in La Ceiba, Tela, Omoa / Cortés Areas

The contents of fostering and strengthening of fishermen organizations will be the same as in Trujillo, but the implementation period will be posterior.

iii) Fishermen organization in the Eastern Region

In the Eastern Region, menu of fostering and strengthening of the fishermen organization will be the same as those of the Trujillo Area. However, in the Eastern Region, the transportation network is not developed and because of this

reason it is necessary that the organization must ship fish by themselves. In the latter half of the 2nd. short-term period, fish transport vessels will be introduced to the Eastern Region by "2.3 Plan of Fish Marketing Improvement". Therefore, following this schedule, the joint fish shipment practice is to be trained and shifted to its full-scale implementation.

(8) Operation system

Fostering / strengthening of fishermen organization is to be implemented by one (1) foreign expert specialized in its operation and management and one (1) staff of DIGEPESCA.

2.6.2 Operation Plan of Economic Works by Fishermen Organization

(1) Summary of joint shipment works of fishing products

The fishermen organization will sell the fishing product from its members to middlemen, processors, stores and consumers.

There are following two methods for the joint shipment, out of which the most acceptable method will be taken according to the Area zone's marketing custom.

- Consignment sales
  The fisherman will sell his fish products through the organization, and this will obtain a sales commission of more or less 5%. (See example in Table 2.6.6)
- Buying and Selling
  The organization will purchase the product of fishermen and will sell to the traders. (See example in Table 2.6.5)

1) Persons from which the organization will purchase fish products
   - The organization will purchase fishing products from those fishermen that are members of the organization or within the Area zone.
   - In case of the members belonging to the organization, it will be ruled within the internal laws that the members are obliged to sell to the organization.

2) Set up of committee and division for the economic works

In order to initiate the joint shipment works of fish products, it will be necessary to set up the economic works committee which will be responsible of the administration and economic planning, and the works division which will be in charge of executing the works. The committee is composed of the organization's staff, and the works

division is composed of personnel including persons employed from outside.

i) Personnel for the economic works division

The following personnel will be necessary for the economic works divisions.

The number of personnel and their positions will be decided in accordance with the scale of shipment and facilities. (See Table 2.6.7: examples of positions and salaries of personnel)

Examples of personnel:

Position	Responsibilities
1. General Manager	Administration, economic works planning
2. Sales Chief	Purchase sales, and its registry
3. Accounting Chief	Economic works general accounting
4. Sales Assistant	To weigh,product transportation, etc.
5. Driver	To transport fresh fish, ice, etc
6. Watchman	Vigilance of premises
7. Janitor	Cleaning of offices and premises

ii) Labor costs of the economic works division

The earnings from the joint shipment works will cover the labor costs. (See Table 2.6.1).

The initial funds to begin joint ship works will be collected and provided under the understanding and cooperation of organization members. This amount will be returned to the members from earnings of the joint shipment works. Besides, in a beginning, sacrifice of free labor by the staff, general members, even their relatives for necessary works might be considered.

iii) Facilities and equipment, and those rental fee

Facilities

As for the required facilities (offices, storage, ice plant, cold rooms, etc.) for the joint shipment works, a part of the training facilities shall be rented by DIGEPESCA until the time when it is possible for the organization to construct their own facilities.

Such rent shall be for free until the time it is judged the joint shipment works have acquired capability of paying for that rent. The rental fee will be discussed and decided between the fishermen organization and DIGEPESCA.

Equipment

The needed equipment for the joint shipment works are as follows :

- Office equipment : desks, chairs, safe box, computer, etc.
- Communication and transportation equipment : vehicle, telephone, radio unit, etc.
- Fish landing equipment : balance, fish boxes, insulated boxes, carts, etc.

The minimum acquisition of the office equipment / materials will be responsible for the fishermen organization. The communication and transportation equipment will be rented or loaned by DIGEPESCA until it is possible for the fishermen organization to purchase them.

(iv) Items for the training prior to the economic works

The following are training items for committee members and / or personnel of the works division.

- Administration method and management technology of the economic works.
- Orientation and education for the organization members.
- Works control (works planning, execution planning, management planning).
- Accounting.
- Quality control.
- Collection of fish price information in the consumers' market.

(2) Short-term credit works

As it has been described in 2.6.1 (6)-4), the short-term credit works will be implemented by the organization itself, and provide a small-scale credit for short term operation fund and for the improvement of life conditions.

Summary of the short-term credit works is as follow :

a) Reserve for initial fund

The initial fund will be taken from the reserve of the surplus generated by joint shipment works. It will be reserved until it becomes sufficient. (See Table 2.6.8)

b) Timing of credit works commencement

After the commencement of joint shipment works, the timing will be decided based on the reserved amount achieved by the organization.

c) Credit beneficiaries

All members of the fishermen organization

d) Credit guidelines

The credit guidelines for the short-term credit will be determined taking into consideration the organization, fishermen and socioeconomic conditions at the time of commencement of credit works. The financing amount won't be higher than US$ 385/member, at the value of currency as of Jan. 1997.

e) Necessary personnel for the credit works

One or two persons responsible for accounting and clerical works.

f) Training items prior to the introduction of the credit works.

- To educate and train accounting staff of the fishermen organization regarding the credit works.
- To educate this credit works to members..
- To foster members' cooperative spirit and conscience of loyalty towards the fishermen organization.
- To open deposit account and encourage savings.

2.7 Plan of Small-Scale Fisheries Credit

(1) Objective

To foster self-reliant fisheries through providing artisanal fishermen with a small-scale credit access in order to purchase modernized fish production means.

(2) Target fishermen

The target fishermen of this are who are evaluated as a core-fishermen through the training programs provided by "2.2 Plan of Small-Scale Fisheries Modernization".
Evaluation will be done by following view points:

- Achievement level of targeted fish production
- Performance level of guideline as a core-fishermen required by the said "modernization training program".
- Level of mutual assistance spirit as a member of fishermen organization

(3) Plan period

The 2nd and 3rd short-term periods of the master plan period. In the 2nd and short-term period, the project will be implemented to the Trujillo fishermen organization as a model case, and the full-scaled project will be commenced in the 3rd short-term period.

(4) Plan contents and schedule

1) Original fund source

The original credit fund is to be received as a grant from international cooperation agencies. This original fund is deposited as a trust fund to the National Agriculture Development Bank (BANADESA) and to be used for this project.

2) Management body

Actual credit services will be managed by BANADESA or other agencies such as NGO entrusted by BANADESA.

3) Role of fishermen organizations

BANADESA would entrust partial credit service works to a fishermen organization which is evaluated as an autonomous management body after receiving the management training by the project of "2.6 Plan of Fishermen Organization Improvement". The entrusted service works would be as follows:

- Window service of a credit application and its procedure.
- Examination of the applications and issue of credit guarantee
- Window services of accepting repayment

4) Credit guideline

The credit guidelines and screening systems will be set up among relevant agencies such as original fund donors, BANADESA, DIGEPESCA, fishermen organization, etc.

(5) Credit scale

The credit scale of one application would be set up such amount that enable fishermen to purchase one set of fish production means such as boat, outboard engine, fishing year, etc. This credit plan should meet such fund scale as to be enough amount to procure required number of boats to make balance of supply and demand in the north coast at the final year of this master plan period(the year2,012). Total required amount is estimated

at approximately US$1.08 million (See Table 2.7.1).

(6) Implementation schedule

This project will be implemented in the following three (3) stages:

- Experimental stage; to carry out a model credit program to the Trujilo fishermen organization and to monitor the activities for five (5) years.
- Evaluation stage; to evaluate this experimental credit program at the end of the 2nd short-term period to revise the credit system if necessary.
- Full-scale stage; to implement this plan in full-scale in overall areas in the north

2.8. Summary of Sector Plans

The master plan is composed of seven (7) sector plans. These sector plans functions in order to achieve the master plan targets for upgrading the level of current artisanal fisheries qualitatively and quantitatively, through giving influences on each other in the development area zones and/or in development stages. Relation among these sector plans is summarized as follows.

(1) Mutual relation between master plan targets and sector plans

The master plan will attain the targets when following three aspects give positive influences on each other:

- Production aspects
- Fishermen's organization and fund aspects
- Social and environmental aspects

Also each aspect will function well when related sector plans give positive influences on each other as shown in the Fig. 2.8.1.

(2) Mutual relation of sector plans with development area zones

See Table 2.8.1.

(3) Mutual relation of sector plans with development time stages

See Table 2.8.2.

(4) Mutual relation among sector plans, area zones and time stages

See Table 2.8.3.

3. Facility / Equipment Plan

3.1 Outline of Facility/Equipment Component of Sector Plan

3.1.1 Consideration Points for Facilities and Equipment Planning

The major project components and the physical plan for each sector plan have been set up taking into consideration the following aspects;

- To set up optimum function and capacity for requirement of the objective Area.
- To conform to the existing infrastructure conditions.
- To avoid high maintenance and operational costs for the operation of the facilities.
- To conform to existing geographical and meteorological conditions.
- To harmonize existing social organization, facilities and living environment.
- To suppress minus-impacts to the surrounding environment.

3.1.2 Major Facilities and Equipment

Outlines of the planned major facilities and equipment are shown in the following tables(summary of facility/equipment component by sector plan is shown in Table 3.1.1);

A. Plan of capacity building for coastal resources management

One of the main activities of this sector plan is to grasp scientifically the profiles of fisheries resource dynamics and ecological characteristics of the coastal waters. Relevant research covers all the main fishing grounds in the north coast. The research station will be provided in Omoa and Trujillo Areas in the Western Region and Brus Laguna Area in the Eastern Region. Major facilities and equipment are shown below. (See Facility Plan in Fig.3.1)

Item	Component	Detail
1. FIELD RESEARCH LAB<1		
(1) CONSTRUCTION		
1) Building	- Wet lab. 10 sq.m - Office room, 7 sq.m - Equipment storage, 7 sq.m - Toilet	• 1 story, floor area 24 sq.m Spread foundation RC structure & brick wall Wooden truss Corrugated cement sheet R.
2) Electricity, Plumbing	- Normal power supply - Fresh water supply -Laboratory installation & treatment system	• 110V/ 50HZ • City water intake & reservoir
(2) Equipment	- Measuring instrument - Communication kits	• Standard equipment unit • Radio, battery, antenna
2. RESEARCH VESSEL		
(1) Research vessel with equipment	- Coastal research vessel - Coastal resources survey equipment	• FRP made, approx. 35 ft. • Diesel engine, 100 HP, • Radio communication • Survey instruments & gear

Remarks; <1. For the facilities located in Eastern Region, well, rain water reservoir and radio communication with solar power would be provided.

B. Plan of small-scale fisheries modernization

Major activities of this sector plan is the modernization training for artisanal fishermen. In each Area zone, training facilities of Area Center, Area Branch and Service Station are provided. Their grade and scale are different from each others according to social , natural and infrastructural conditions in Area zone.

B-1. Area Center Component

Following 4 Area Centers are provided in this sector plan.

B-1-1. Area Center of OMOA

The facility plan of this Area Center is composed of renovation of existing old Omoa Fisheries Center belonging to DIGEPESCA and construction of an ice factory. (See Facility Plan in Fig.3.2, and 3.3)

Item	Component	Detail
(1) Building a) Training/Administrating (renovation)	- Multi purpose working room - Workshop - Office - Storage/toilet, etc.	- One story - Floor area, about 120sq.m, - Almost all renovation except basic structure
b) Ice making factory (new construction)	- Ice-making /storage room - Construction to existing building	- One story - Floor area about 32sq.m, - RC foundation - Steel structure and brick wall
2)Electricity/plumbing	- Power and normal electricity - Fresh water supply - Waste water treatment	- Power/normal transformer and circuit panel - Water reservoir, elevated tank - Septic/seepage
3) Special facilities	- Ice making machine: 1ton/day Ice storage capacity: 2 ton - Back up generator	- Semi-automatic type air cooling type - Diesel type, cover for ice storage cooler; approx. 10Kva
(2) EQUIPMENT 1) Training & maintenance equipment	- Workshop equipment - Administration and monitoring equipment <1	-Fishing gear maintenance tools -Meeting table & stool desk, cabinet
2) Production support equipment	- Fishing boat with motor, fishing gear, etc.	(Fishing unit of 1 boat) FRP boat. L=approx. 25 ft 2 cycle outboard engine, 25 Hp gill net, handline, hand reel, Ice box
	- Ice delivery & fish handling support equipment	Transportation & delivery Ice box Measuring equipment Hand cart, FRP pans
3) Radio communication equipment	- Communication with Area Branch & Service Station	Radio com. Unit, Antenna, battery unit
4) Transportation vehicle	- Ice transportation service	Truck carriage weight: approx. 3 ton Diesel engine,

Remarks; <1. This equipment is to be provided taking into account common usage for that of the Community women support plan or Fishermen organization support plan.

B-1-2. Area Center of Tela

The Area Center is newly constructed along the river flowing through the urban area of Tela. (See Facility Plan in Fig.3.4 and 3.5)

Item	Component	Detail
(1) CONSTRUCTION		
1) Building	- Ice making & handling room - Multipurpose training room for maintenance, training, meeting and fish handling - Work shop - Administration office room - Storage, toilet	1 story, RC foundation with soil improvement Steel structure & brick wall Steel truss Corrugated cement sheet roof Floor area; approx.160sq.m
2) Electricity, Plumbing	- Power and normal electricity - Fresh water supply - Waste water treatment tank	Power/normal transformer & circuit panel Water reservoir & elevated water tank Septic & seepage pit
3) Special facilities	- Ice making machine: 2 ton/day Ice stock capacity: 4 ton - Back up generator approx. 10Kva	Semi-Automatic type air cooling type Diesel type ,cover for ice storage cooler;
(2) EQUIPMENT		
1) Training & maintenance equipment	- Same as B-1-1	- Same as B-1-1
2) Production support equipment	- Same as B-1-1	- Same as B-1-1
3) Radio communication equipment	- Same as B-1-1	- Same as B-1-1
4) Transportation vehicle and/or vessel	- Same as B-1-1	- Same as B-1-1

B-1-3. Area Center of Brus Laguna & Puerto Lempira

The Area Center of Brus Laguna Area is constructed at a small island facing to its populated area, and that of P.Lempira is at a part of the public land facing to the Caratasca Lagoon near the center of populated area. (See Facility Plan in Fig.3.6, 3.7 and 3.8)

Item	Component	Detail
(1) CONSTRUCTION		
1) Building		
a. Adm./training building	- Ice making & handling room - Multipurpose training room for maintenance, training, meeting and fish handling - Work shop - Administration office room - Storage	1 story, RC foundation with soil improvement Steel structure & panel wall Steel truss Corrugated cement sheet roof Floor area; approx.110 sq.m
b. Utility building	- Toilet, washbasin, rainwater-tank, shower room, storage	Floor area; approx.24 sq.m
c. Dormitory building	- 2 dormitory room, kitchen meeting room, storage	Floor area; approx. 48 sq.m
2) Access jetty & jetty		
a. At Brus Laguna	- Access jetty - Jetty	Spread foundation RC panel slab RC column
b. At Puerto Lempira	- Access jetty & Jetty are as as same as Brus Laguna. - Additional floating jetty L= approx. 30m	FRP made sell type; floating jetty for light handling type
3) Electricity, Plumbing	- Power and normal electricity - Fresh water supply - Waste water treatment tank	Power/normal transformer & circuit panel Water reservoir & elevated water tank Septic & seepage pit & elevated water tank
4) Special facilities	- Ice making machine: 1ton/day Ice stock capacity: 2 ton - Diesel Generator - Solar type small lighting system will be allocated	Semi-Automatic type air cooling type approx. 12 Kva Solar lighting ; 20w
(2) EQUIPMENT		
1) Training & maintenance equipment	- Same as B-1-1	- Same as B-1-1
2) Production support equipment	- Same as B-1-1	- Same as B-1-1, except outboard engine 15HP instead of 25HP
3) Radio communication equipment	- Same as B-1-1	- Same as B-1-1
4) Transportation vehicle and/or vessel	- Ice & fuel transportation service (Puerto Lempira) (Brus Laguna)	Truck loading capacity : approx. 3 ton, Diesel engine, FRP boat 25FT, Engine 40HP FRP boat 25FT, Engine 40HP

B-1-4 Area Center of Trujillo and La Ceiba Areas

The Area Centers are constructed under the different project during the period of 1988. However their function and roles are taken into account under the overall concept of this master plan. (See Facilities Plan in Fig 3.9 and 3.10)

B-2. Area Branch and Equipment Installed

The Area Branch is constructed in each Area zone as a subordinate body of the Area Center. The ice is supplied from the Area Center. An itinerating training for fishermen is carried out once or twice a week. Standardized facilities /equipment plan is as follows. (See Facility Plan in Fig.3.11)

Item	Component	Detail
1. FACILITIES		
(1) CONSTRUCTION		
1) Building		
a. Training building	- Ice store & handling room - Multipurpose training room for maintenance, training, meeting and fish handling - Equipment storage - Administration office room	1 story, RC foundation with soil improvement Steel structure & panel wall Steel truss Corrugated cement sheet roof Floor area; approx. 72 sq.m
b. Utility building	- Toilet, washbasin, rainwater-tank, shower room, storage	Floor area; approx. 18 sq.m
2) Electricity, Plumbing	- Normal power electricity - Fresh water supply - Waste water treatment tank *in the case of no electricity site, diesel generator & solar power small lighting system will be allocated	Normal circuit panel Water reservoir & elevated water tank Septic & seepage pit Solar lighting 20W
4) Special facilities	- Ice store insulation - Generator for common use	Insulation panel Capacity ; approx. o.5 Kva
(2) EQUIPMENT		
1) Training & maintenance equipment	- Same as B-1-1	- Same as B-1-1
2) Production support equipment	- Same as B-1-1	- Same as B-1-1
3) Radio communication equipment	- Same as B-1-1	- Same as B-1-1
4) Transportation vehicle	- One motorcycle - 2 bicycle	4 cycle 175 cc engine Standard type
a. Western Region	- Transportation boat (Only to Tornabe Branch)	25FT, FRP boat, 40HP
b. Eastern Region	- Transport boat	25FT, FRP boat 40HP

B-3. Service Station and Equipment Installed

As in the case of Area Branch, the Service Station is constructed in each Area zone as a subordinate body of the Area Center. But its activities are focused on the fishing training. The ice is supplied from the Area Center. Standardized facilities/equipment plan is as follows. (See Facility Plan in Fig.3.12)

Item	Component	Detail
(1) CONSTRUCTION		
1) Building	- Small Ice store room - Multipurpose room for maintenance, training, meeting and fish handling - Equipment storage - Toilet, washbasin, rainwater-tank	1 story, RC foundation with soil improvement Steel structure & panel wall Steel truss Corrugated cement sheet roof Floor area; approx. 40 sq.m
2) Electricity, Plumbing	- Fresh water supply - Waste water treatment tank	Normal circuit panel Water reservoir & elevated water tank Septic & seepage pit
(additional arrangement)	*in the case of no electricity site, generator & solar power small lighting system will be allocated	Solar lighting 20W
4) Special facilities	- Ice store insulation - Generator for common use	Insulation panel Capacity ; approx. 0.3 Kva
(2) EQUIPMENT		
1) Training equipment	- Same as B-1-1	- Same as B-1-1
2) Production support equipment	- Same as B-1-1	- Same as B-1-1
3) Radio communication equipment	- Same as B-1-1	- Same as B-1-1
4) Transportation vehicle	- One motor cycle 2 bicycles	4 cycle 175 cc engine Standard type

B-4. Fish Depot Station

These stations are provided only to the Brus Laguna and the P.Lempira Area Centers, and constructed at each of the month of Brus Lagoon and Caratasca Lagoon. Fish from surrounding areas is temporarily stored in these depot stations. The ice is supplied from the Area Center. The fish transport vessels will pick up the fish and ship to TFCB at Puerto Castilla in the Western Region.(See Facility Plan in Fig.3.13)

Item	Component	Detail
(1) CONSTRUCTION		
1) Building		
a. Fish handling building	- Fish handling area - Ice store & handling room - Work shop - Storage, washbasin, - Fuel stock yard	1 story, RC foundation with soil improvement Steel structure & panel wall Steel truss Corrugated cement sheet roof Floor area; approx. 40 sq.m
2) Access jetty & Jetty	- Access jetty	Spread foundation
	- Jetty	RC panel slab RC column,
3) Electricity, Plumbing	- Water supply; shallow well & rainwater - Solar type small lighting system	- Rain water reservoir approx. 400L Solar lighting ; 20w
4) Special facilities	- Generator;	0.3kva
(2) EQUIPMENT		
1) Fish collection management support equipment	- Fish handling equipment	- Repair tools, insulated box - Measuring equipment - Push cart, etc.
	- Administration and monitoring equipment	- Desk, chair, cabinet
2) Radio communication equipment	- Same as B-1-1	- Same as B-1-1

C. Plan of Fish Marketing Improvement

This sector plan is composed of three (3) sub-programs for the purpose of activity fish marketing in the north coast. The contents of sub-programs are as follows.

C-1. Plan of Trujillo Fish Collection Base (TFCB)

A fish collections base is constructed at Puerto Castilla in Trujillo Area in order to concentrate fish product of core fishermen groups in this Area zone and shipped from the Eastern Region, and sold to fish traders. The facilities and equipment plan is as follows. (See Facility Plan in Fig.3.14)

Item	Component	Detail
(1) CONSTRUCTION		
1) Building		
a. Fish handling building	- Fish handling area - Ice making & handling room - Work shop - Administration office room	1 story, RC foundation with soil improvement Steel structure & panel wall Steel truss Corrugated cement sheet roof
b. Utility building	- Storage, Toilet, washbasin, - Fuel stock yard	Floor area; approx.110 sq.m Floor area; approx.24 sq.m
2) Access jetty & Jetty	- Access jetty	Spread foundation
	- Jetty	RC panel slab RC column
3) Electricity, Plumbing	- Power and normal electricity - Fresh water supply - Waste water treatment tank	Power/normal transformer & circuit panel Water reservoir & elevated water tank Septic & seepage pit & elevated water tank
4) Special facilities	- Ice making machine: 1ton/day Ice stock capacity: 2 ton - Diesel Generator approx. 10 Kva	Semi-Automatic type air cooling type For ice storage cooler only
(2) EQUIPMENT		
1) Fish collection management support equipment	- Workshop equipment	Equipment maintenance Tools
	- Administration and monitoring equipment	Meeting table & stool Desk, cabinet
2) Radio communication equipment	- Communication to area center, area branch and service station	- Same as B-1-1
3) Transportation vehicle	- Transportation service base to Tocoa, La Ceiba area	Cab over type truck Loading ; approx. 3 ton Diesel engine

C-2. Program of Fish Marketing Improvement in Eastern Region.

Fish transport vessels are introduced to each of the Area Centers in the Eastern Region, in order to ship periodically to TFCB. The planned equipment is as follows.

Item	Component	Detail
(1) FACILITIES	- None	- None
(2) EQUIPMENT		
1) For fish shipment	- Fish transport vessels<1	• FRP boat (100HP, 8GT) Max. about 10 knots
2) For fuel shipment	-Drums	• 200L/drum

Remark <1 : These are maintained at TFCB. To be provided to Brus Laguna Area Center at first, and then to Puerto Lempira Area Center when the facility is constructed. On the return trip from TFCB, fuel and lubricant oil for fishing operation for the project are transported.

C-3. Improvement Program of Fresh Fish Sales Method in Consumer's Market

To provided a sanitary and better looking fish sales unit as a model to consumer's market in order to increase the level of fish consumption in the coastal urban areas (Western Region only). The equipment plan is as follows.

Item	Component	Detail
1. MARKET PROMOTION UNIT-1		
(This unit will be installed at major consumer's market in each Area zone of Western Region)	(Antenna shop unit-1)	
	- Low temperature stock	Chest freezer; -5Åé, 200L
	- Sample show case	FRP & Acrylic made
	- Handling box x 2	Insulation box 20L
	- Management equipment	Cabinet & table Measuring tool & tools
	- Electricity, plumbing works & installation works	Connection & preparation works
2. MARKET PROMOTION UNIT-2		
(This unit will be allocated at each Area Center in Western Region)	(Antenna shop unit-2)	Insulation box; 50L x 2 nos
	- Insulated box	FRP & Acrylic made
	- Sample show case	Insulation box 20L
	- Handling box	Cabinet & table
	- Fish cutting equipment	Measuring tool & tools
	- Movable cart	Steel frame galvanized Nylon sheet
	- Weather defense installation	0.2-0.3 Kva
	- Generator for lighting	

D. Plan of Fisheries Community Infrastructure Improvement

To provide rental equipment necessary for improvement works of community infrastructure by way of self-support efforts by village people themselves. The equipment plan is as follows.

Item	Component	Detail
1. EQUIPMENT UNIT FOR SELF SUPPORT WORKING		
	(Equipment unit)	
	- Road & ditch maintenance	1 wheel cart, concrete mixing tools, etc.
	- Canal maintenance	Chain saw, hand saw, etc.
	- House maintenance	Carpentry work tool
	- Sanitary maintenance	Standard pipe maintenance tool & excavation tool
2. SUPPORTING MATERIAL UNIT	(Material unit)	
	- Road & ditch maintenance	Roll of steel wire, etc.
	- Canal maintenance	Nylon rope, etc.
	- House maintenance	Steel corrugated sheet, etc.
	- Sanitary maintenance	PVC pipe, vinyl hose, etc.

E. Plan of Fisheries Community Women Support

This plan is composed of various kinds of training programs intending to make community women actively participate to fisheries activities and village lives. The target of the plan is to foster core women groups in each fishing village in the north coast. The equipment plan is as follows. The itinerating training is emphasized due to difficult situation of village women to get away from their village.

Item	Component	Detail
1. TRAINING AND EDUCATION UNIT	(Equipment unit)	
	Equipment for:	Repair tools
	*fishing operation support	(common usage with those of modernization training)
	*fish sales	Same as C-3
	*processing	Dry stand, knife, etc
	*informal education	Textbook of Spanish, etc
	*vocational training	Sewing machine, handicraft tool, etc
	*nutrition & health training	Cooking apparatus, textbook, etc.
2. MATERIAL UNIT		
	(Material unit)	
	- Training material for each program:	Cloth, pencil, paper, etc
	- Vehicle	Common usage with those of Area Center

F. Plan of Fishermen Organization Support

This plan is mainly composed of the training program of joint shipment works of fish products in order to substantially activate existing fishermen organization. In the early stage, the organization in Trujillo area is tried to be activated as a model case. Activation in other five (5) Area will be done according to the plan progress of fishermen's training facilities. The equipment plan is as follows.

Item	Component	Detail
1. SUPPORT UNIT-1 (Provided to TFCB and each Area Center)	(Equipment unit-1) Equipment for: - Operation/management	Cabinet table, chair calculator, safety box, etc.
	- Shipment record	Typewriter, etc.
2. SUPPORT UNIT-2 (Provided to each Area Branch)	(Equipment unit-2) Equipment for: - Fishermen's self support equipment	Filing cabinet, table, chair Calculator, safety box, etc.

G. Plan of Small Scale Fisheries Credit

This plan is composed of fisheries credit works for core fishermen groups fostered by the aforementioned modernization training program for artisanal fishermen. The plan will be implemented on the experimental basis at first in Trujillo Area, and then extended to other Area zones after obtaining good evaluation results in the model case of the Trujillo Area.

Item	Component	Detail
1. SUPPORT UNIT-1 (This unit is provided at each of Trujillo, Tela, Brus Laguna and Puerto Lempira Area Centers.)	(Equipment unit) Equipment for: - Document management	Filing cabinet, table, chair, calculator, safety box, etc.
	- Vehicle	Small pick up truck, motor cycle

3.2 Cost Estimation

3.2.1 Condition of Cost Estimation

The project costs for provision of facilities and equipment of this master plan have been estimated based on following conditions ;

(1) Estimated based on the price as of the beginning of 1997.
(2) Estimated on the basis of US$ (US$ = Lps. 13)
(3) The costs of imported materials / equipment include those of the overseas and domestic transportation, but assume to be exempted from the tax.
(4) Applied CIF prices for the costs of imported materials / equipment.
(5) The construction is assumed to be contracted by foreign contractors.
(6) The unit price of the building construction is basically based on the schedule of rate periodically issued by the local construction contractor's association. However, as for the measurement costs against natural disasters and soft grounds, the standardized costs has been set up taking into account the options of local constructors and architects.
(7) The construction cost of each project site has been estimated as the total of the average construction cost of San Pedro Sala and the transportation costs of materials / equipment to each site. Such transportation costs have been obtained based on the information from local transporter covering the site area.
(8) The proportion of direct and indirect construction cost was preliminary obtained taking into account costs of the temporary works and site expenses of the projects and the examples of similar construction works done by USAID, and then adjusted and set up its value based on the opinions of local constructors and architects.
(9) The costs for the topographic and soil surveys are not included in the project cost estimation.

3.2.2 Summary of the Cost Estimation

The estimated costs are summarized as follows ;

(1) The project costs by sector plan (See Table 3.2.1)
(2) The costs by sector plan and by development stage (See Table 3.2.2)