

**CHAPTER IX. FEASIBILITY STUDY ON MARANGOG
AREA**

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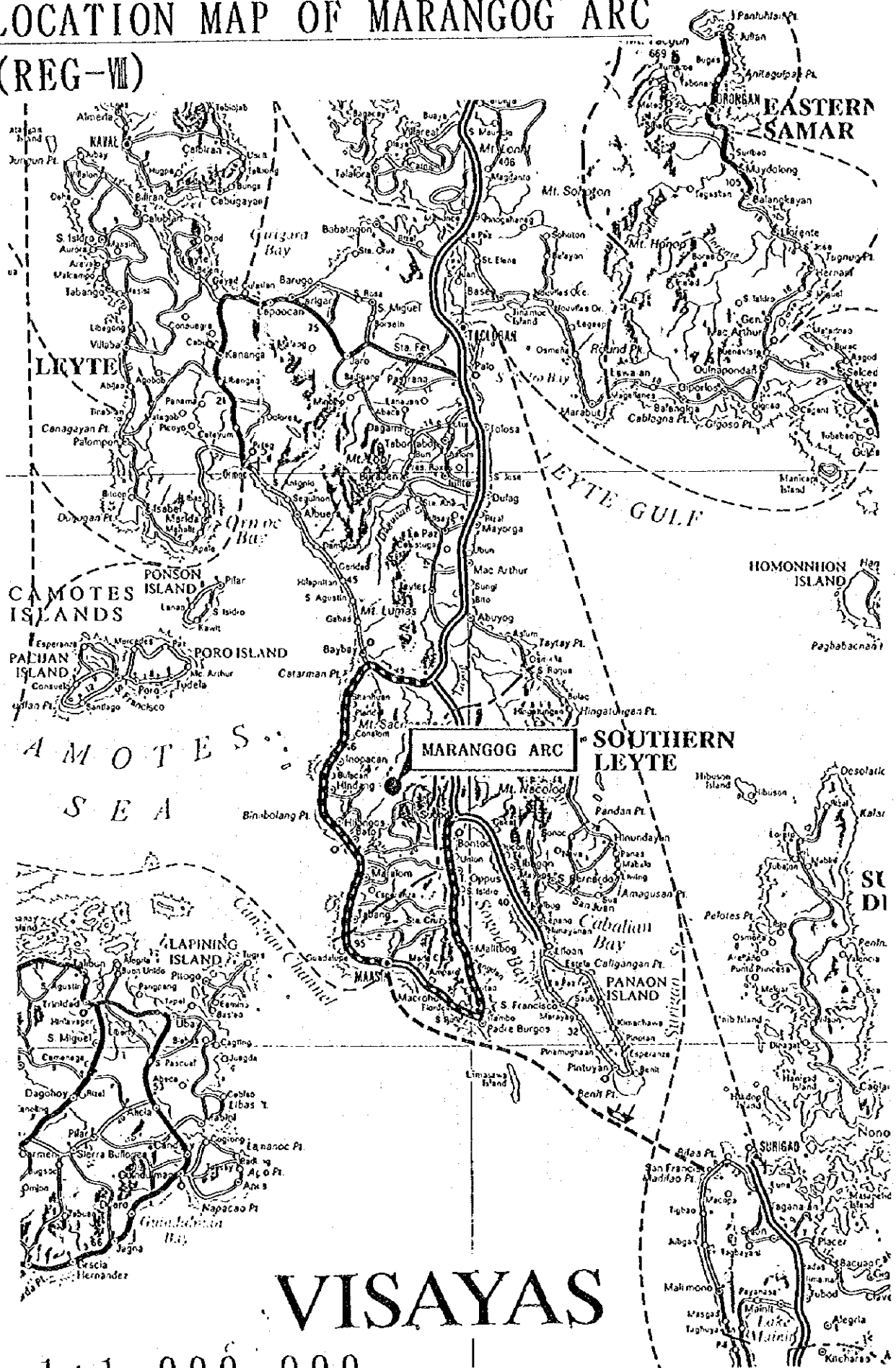
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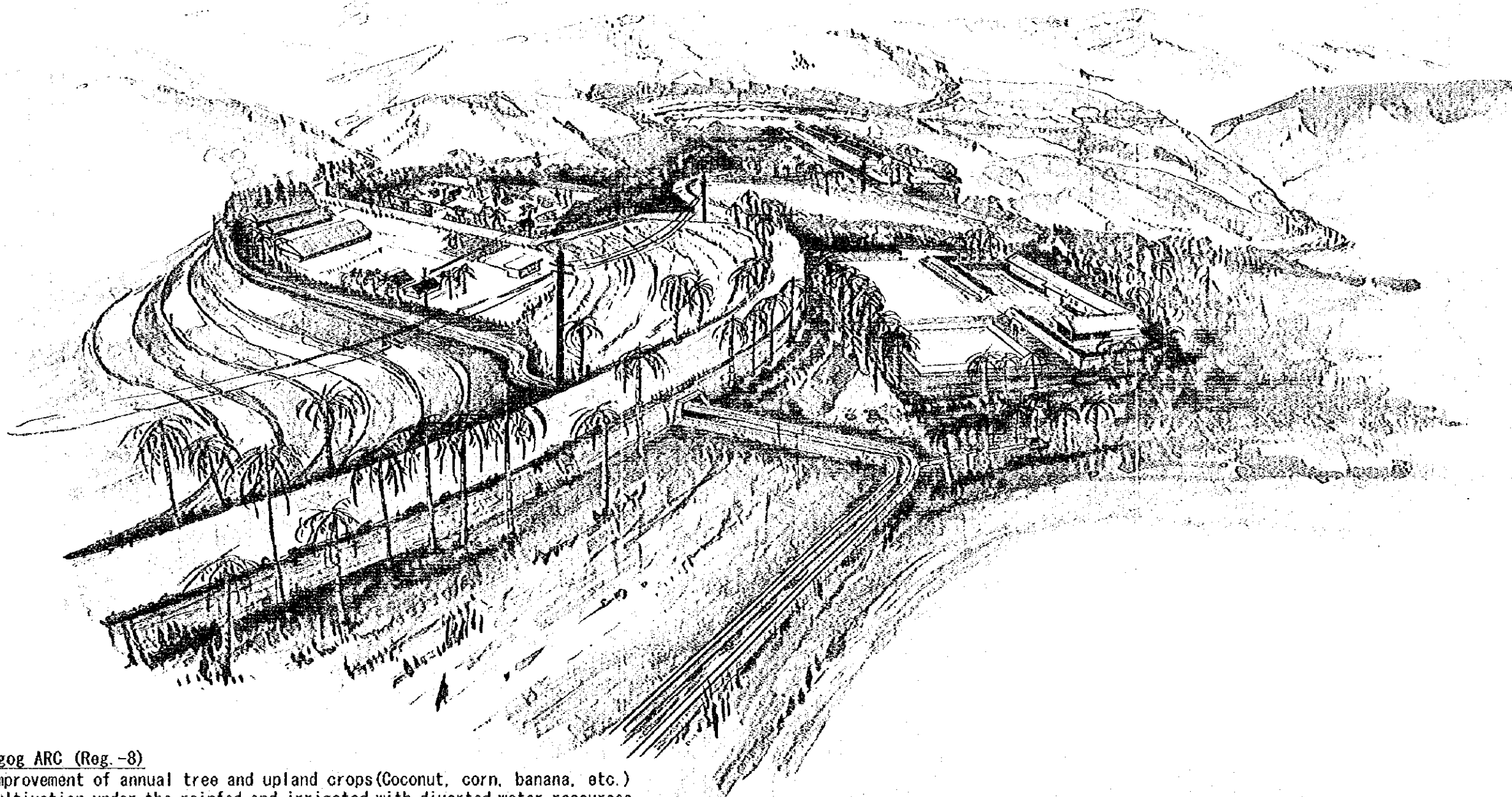
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LOCATION MAP OF MARANGOG ARC

(REG-VII)



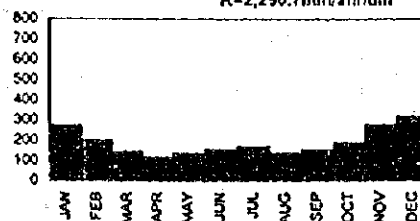


Malangog ARC (Reg. -8)

- Improvement of annual tree and upland crops (Coconut, corn, banana, etc.) cultivation under the rainfed and irrigated with diverted water resources from adjacent small river.
- Introduction of sloping agriculture under the relative steep slope of land with low ratio of area percentage less than 18 percent.
- Improvement of agriculture and rural infrastructural facilities, especially improvement rural roads.
- Provision of transmission line for rural electrification.
- Necessity of countermeasures for environmental conservation to meet soil erosion in sloping areas.
- Strengthening of farmers' organization and enhancement of institutional capability through participatory approach of farmers.

TACLOBAN CITY, LEYTE

R=2,290.7mm/annum



DEVELOPMENT VIEW OF MARANGOG ARC

CHAPTER 9 FEASIBILITY STUDY ON MARANGOG AREA

9.1 Present Situation of the Area

9.1.1 Comprehensive Agrarian Reform Program (CARP)

1) Progress of CARP

The Marangog ARC was implemented in 1995 under the Comprehensive Agrarian Reform Program. The present distributed lands for the Area as of June 1996 is 67 ha out of the targeted area of 516 ha. The total Project Area is 330 ha.

Present Land Distribution under CARP

Manner of Acquisition	Scope	Accomplishment	
	(ha)	(ha)	(%)
- Operation Land Transfer (OLT)	31.0	0	0
- Government Lands	4.4	0	0
- Settlement	481.0	67.3	14.0
Total	516.4	67.3	13.0

2) CARP Organizations and Activities

The CARP organization and its activities are discussed in Chapter 7.1.1 of Chapter 7. The related organizations are shown in Figure B.1-1 to Figure B.1-4.

9.1.2 Physical Conditions

1) Location, Area and Topographic Conditions

The Marangog Project Area belongs administratively to the municipality of Hilongos, province of Leyte and Region-VIII. The Area is situated within the resettlement area. The access to the Project Area is very difficult due to poor road condition, especially during rainy days.

Generally, the identified terrain of the Project Area is rolling to hilly with an elevation ranging from 90 m to 260 m above mean sea level.

2) Meteorological and Hydrological Conditions

The climate condition around the Area is categorized by PAGASA as Type-IV. It has no distinctive dry or wet seasons although rainfall is approximately evenly distributed throughout the year. This is also intermediate between Type-1

and Type-II climate. However, it resembles Type-II more closely since it has no dry season. The Area is visited by typhoon 34 times a year on the average.

The major features of the climate are summarized as follows, according to the climate data observed at Tacloban station.

Major Features of Meteorological and Hydrological Conditions

Month	Rainfall (mm)	Temperature			Relative Humidity (%)	Pan- Evaporation (mm)
		Mean (°C)	Max. (°C)	Min. (°C)		
Jan.	274.6	25.7	28.7	22.7	86	89.9
Feb.	201.5	25.9	29.1	22.6	85	98.0
Mar.	145.5	26.5	29.9	23.1	83	120.9
Apr.	117.7	27.5	30.9	24.0	82	129.0
May	137.5	28.1	31.4	24.7	82	133.3
Jun.	157.2	28.0	31.4	24.6	83	102.0
July	171.4	27.7	31.1	24.4	83	93.0
Aug.	140.3	28.0	31.4	24.4	82	108.5
Sept.	154.9	27.9	31.3	24.4	83	102.0
Oct.	189.8	27.6	31.0	24.2	84	96.1
Nov.	279.7	27.0	30.2	23.8	86	78.0
Dec.	320.6	26.3	29.3	23.3	87	80.6
Total/Ave.	2,290.7	27.2	30.5	23.9	83.8	1,231.3

Source : PAGASA

Note : Evaporation is derived from Visca Baybay (Leyte) station

9.1.3 Administration, Socio and Farm Economic Conditions

1) Administration and Rural Organization

a) Administration of Project Area under CARP

The overall supervision and policy direction of CARP are the same in all provinces nationwide and are discussed extensively in Chapter 7.1.3 (I).

b) Political Leadership Structure

Municipal Government Unit

With the enactment of the Local Government Code in 1991, some functions of the national offices were devolved to the local government, such as the health, social services and development, education, environment, public works and agriculture. The municipal government is thus task to directly provide the basic services and utilities needed at the barangay level.

The Project Area is under the jurisdiction of Hilongos municipality. It is one of the 51 barangays covering the municipality. The municipality is headed by the municipal mayor. The other officials of the municipality are the vice mayor, sangguniang bayan members and the heads of offices. There are 13 offices under the municipality of Hilongos.

Barangay Government Unit

The barangay is the basic political unit and serves as the primary planning and implementing unit of government policies, plans, programs, projects and activities in the community. It is also an area where collective views of the people may be expressed and considered. The chief or head of the barangay is the barangay chairman. The other persons in authority are the seven sangguniang barangay members.

Since the barangay is apportioned a budget from the Internal Revenue Allotment Fund (IRA fund), it is mandated to provide basic services and facilities to the community. The other possible sources of funds for development projects in the barangay are the Countryside Development Funds (CDF) of Members of Congress, budget allocations from the municipal and provincial government not included in the barangay fund.

The capacity and ability of the barangay officials to implement development changes in the community can be gleaned by the number of project, facilities or services provided from the barangay IRA fund and other sources.

For the Hilongos Area, the projects implemented for the period 1995-1996 were: construction of public toilet, distribution of toilet bowls to interested barangay residents, construction of nursery for seedlings, repair and rehabilitation of communal pipe within the barangay proper and new connection in sitio Iba, and construction of day-care center. The sources of funds for the implemented projects are the IRA fund of the barangay and from the office of the municipal mayor. Except for the construction of the day care-center, all the projects implemented, has no community participation (refer to Table I.2-11).

2) Population and Farm Household

The estimated total farm household of the Marangog Area is 247. Of this number, about 137 or 55 percent are direct beneficiaries of CARP. Only nine of these beneficiaries are transient farmers mostly living in nearby barangays. The average household size of the marginal area is 6.1.

Population and Farm Household

Total Population & Household in the Barangay		Sitio/Purok Covered by the Area	Area Covered	Total Farm HH	ARBs		Other ARBs	Total HH ARBs
					Recipient of Land (No. of Household)			
HH	Pop.				Permanent	Transient		
		1. Proper	P	98	54	2	42	98
		2. Caimito	P	60	25	2	33	60
		3. Iba	P	54	28	2	24	54
		4. Guintolian	P	35	30	3	2	35
247	1,309	Total		247	137	9	101	247

P = Partial

Other ARBs means the small holder farmers, leaseholders, farm workers, etc..

There are more males (54%) than females (46%) in the Area. The 15-64 age bracket, considered the economically active population comprises about two-thirds (63%), while the younger population (0-14) and the much older population (65 and above), about one-third (37%). The 15-19 age range has the most number of population (15%).

3) Landholding and Land Tenure

The Marangog Area is a part of the Leyte Settlement area. The total area of the settlement is 481 ha. Distribution accomplishment is only 14 percent. About 41 CLOA has already been distributed to individual farmers. The other source of land for CARP is the OLT, composed of about 31 ha. Under this program, no CLOA has been distributed to the farmers due to non completion of payment to landowners. The average farm size is 2.62 ha.

4) Living Conditions

The road from the Hilongos to the Project Area site is about 16 kms. From Hilongos to barangay Concepcion the road is good (some portions paved while others are gravel). From barangay Concepcion, a river without bridge exists which is passable by truck or any four-wheel vehicle during the dry season. However, from the river crossing to the Project Area, the road is poor. During the wet season however, the road becomes eroded, hence big stones and limestone come out making the roads not passable to any type of vehicle. The motorcycle can still be used under this road condition. However, the passenger has to alight and walk a hundred meters or more before riding again. During this period, the farmers bring their produce to the nearest market, in barangay Concepcion, using a sled pulled by carabao or by carrying them on foot. Also, during the wet season, the river becomes big that makes it impossible for the farmers to cross. The Project Area becomes isolated during this period.

The source of domestic water is the spring located about less than one kilometer from the center of the barangay. The spring has been tapped for

domestic water use. Pipes made of bamboo and PVC has been used to bring water to the residential areas.

The area is not yet energized. It is however, programmed for implementation in early 1997. A complete elementary school is available in the Area. For secondary education, the school children avail of the facilities of barangay Concepcion or the poblacion, in Hilongos. Other facilities available are the center, consisting of the barangay hall and multi-purpose pavement, etc.

Farmers bring their produce to barangay Concepcion during market days, usually on Saturdays. The products brought by the farmers to the market are corn, peanuts, rootcrops, banana, livestock, chicken. At the same time, the farmers buy their daily needs like rice, oil, sugar, salt, etc. During the periods that the roads are passable, the traders usually pick-up the copra products in the ARC site. However, during the wet season, the farmers bring their produce to barangay Concepcion. The average income from farming and other farm related activity is 10,312 pesos annually.

Of the 12 Study areas, Marangog has the highest percentage of population without formal education (about eight percent). Its population with completed elementary education is 21 percent with about four percent of its population completing secondary education. Almost half (45%) of the population have at least elementary education.

5) Farm Economy and Poverty Conditions

a) Farm Production

At the regional level, farmers in Region-VIII put most of their farm land under coconut. Other crops include rice, corn, abaca, cassava, banana, camote and sugarcane. Areas less than 1,000 ha are planted with peanut, cacao, mungo, pineapple, eggplant, calamansi, mango, tomato, tobacco and cabbage.

In the province of Leyte, coconut, rice, corn, abaca, sugarcane, cassava and banana are mostly grown along with peanut, mungo, pineapple, eggplant, coffee, cacao, calamansi, tobacco, mango and cabbage.

At Marangog ARC, the average landholding of a family is 2.66 ha. This average landholding is divided into 0.96 ha of land for temporary crops; 1.51 ha for permanent crops; 0.18 ha of idle land; 0.01 ha of homelot.

The average planted area of rice at Marangog Area is 0.16 ha yielding an average production of 500 kg per ha. Dry season palay is grown on an average planted area of 0.08 ha. More farmers grow high-yielding rice during dry season than the traditional one. The majority grow it as a single crop.

While none grow wet season corn, a large number of farmers at Marangog (72%) grow dry season corn on an average planted area of 0.70 ha of which yields only 350 kg per ha. The major reason for this low yield is that almost all (97%) farmers grow the traditional white corn only for home consumption. Besides, most grow it only once a year.

Other annual crops grown by small number of farmers are root crops and tobacco. Coconut is the major tree crop grown by most farmers. Most of the coconut grown is of traditional varieties. Banana is the other major fruit tree.

The numbers of livestock raised during July 1994 - June 1995 were 27 cattle, 79 carabaos, 78 goats, 66 pigs, 257 meat-chickens and 40 layers.

b) Farm Household Income

The average farm income per household in the Area is 15,498 pesos. The major sources of non-farm income are trading business, local and overseas remittances, wage, allowances from relatives and rents for working animals that together provide an average/annual income of 2,939 pesos per household.

c) Farm Production Values

In 1996, the farmers earn the highest percentage of the crop market value of coconut (75%); followed by abaca (13%). Others including corn, peanut, banana, and palay constitute less than one percent each.

d) Farm Production Costs

Information on production expenses of various crops and livestock produced are as follows:

Paddy

- Seed used : 10-15 kg/ha
- Fertilizer application
 - Urea : 5-50 kg./ha at 7.80 peso/kg
 - 21-0-0 : 5 kg/ha at 10.00 peso/bag
 - 14-14-14 : 5-50 kg/ha at 8.00 peso/bag
- Hired labor:
 - Plowing : 1md at 50-60 peso/md
 - Weeding : 5-8 md at 50-60 peso/md
 - Harvesting : 1:7 for weight of harvested paddy

Corn

- Type of corn grown : white corn for home consumption.
- Amount of seed used : 5-9 kg/ha
- Hired labor:
 - Plowing : 2-12 md at 50-60 peso/md plus food
 - Planting : 1-5 md at 50-60 peso/md
 - Harvesting : 111:1,000 or 1:9 of harvested corn

Peanut

- Seed used : 33 kg/ha at 10 peso/kg
- Yield : 100-1,000 kg/ha
- Hired labor: Plowing : 6-16 md at 40 peso/md
Weeding : 3-6 md at 40-50 peso/md
Harvesting : 5-10 md at 50 peso/md

Coconut

- Seedling used : 100-400 pieces/ha
- Hired labor: Harvesting : 2-6 md at 40 peso/md or 2 peso/tree

Carabao

- Rope : 10 meter at 2 peso/meter

Hog

- Feed: Rice bran : 150-500 kg/pig at 5 peso/kg
Corn : 150 kg/pig at 5 peso/kg
: Esteria feed supplement 10 cans at 5 peso/can
- Rope : 1.5 meter at 3 peso/meter

Goat

- Rope : 6 meters at 3 peso/meter
- Salt : 0.5 kg at 5 peso/kg

Poultry

- Feed: Corn : 2.25 kg/week at 7.50 peso/kg
Root crops : one can/month at 50 peso/can

e) Household Farm Workers

The family members work mostly on farm (62%). Some work on other farms (11%) and in non-farm activities (27%).

6) Conditions of Social Capability

a) Present Condition of Social Capability

An assessment of the barangay community was undertaken during the Phase-II study to determine the conditions of social capability and preparedness of the community to implement projects. Items considered are: participation of community in the implementation of projects; maintenance and management of facilities and services; membership in any type of community organization; participation in assembly meetings, organization meetings, and traditional and non-traditional collective activities; decision process; etc.

Community Participation in Barangay Activity/Projects

The barangay council has implemented at least five projects for the period 1995-1996. However, of the five projects undertaken, only one project has community involvement and participation, that is, the project for the construction of the day-care center. Due to the absence of good roads, specially during the wet season, commodities cannot enter the barangay. Hence, for the materials needed for the construction of the day-care center, the barangay residents have to assist in the bringing in of materials. Except for the toilet bowl distribution (a project of the municipal mayor), all barangay projects were funded from the IRA fund of the barangay (refer to Table I.2-11).

From the interview and discussions with the barangay captain and two kagawad members, it appears that only the barangay officials are very much involved in project activities. It is only the day-care center project that involvement of the community is being tapped. In this project, the members of the community were enjoined to participate by bringing in materials inside the barangay as these construction materials were only delivered to the adjoining barangay due to the non-accessibility of the roads in the Area.

Maintenance of Barangay Facilities and Resources

The facilities and utilities of the Area are as follows: complete elementary school (three buildings with 10 rooms; two buildings under poor condition while one building is newly constructed); day-care center (at present using the second floor of the barangay hall); free flowing communal pipe located at the barangay proper (with two places) and at sitio of Iba (with two places); spring with improvement (intake tank with two hose/pipes connected to the barangay); community center (with the following facilities: barangay hall (two stories with area of 40 sq. m.); auditorium; small warehouse; multi-purpose pavement; basketball court; barangay chapel; barangay road (refer to Table I.2-12).

i) Elementary School

At the start of the school year, the teachers call a meeting of parents with the participation of the barangay officials. In this meeting the teachers would ask the assistance of the community in the maintenance work of the school. The teachers together with the parents-officials of the barangay community identify the activities to be undertaken and the materials and others needed for the community work. During this period the parents elect the officials of the Parents-Teachers Association (PTA). It is this organization together with the barangay officials who would spearhead the community activity to be undertaken for the maintenance of the school. The group will then decide the day and time that the community activity will have to be undertaken. The community activity is disseminated to the barangay residents through the officers of the PTA, the barangay officials, the kagawads representing the different sitios and also through the school children.

For the Marangog residents, the maintenance of the school facilities and surroundings has become a yearly collective action and activity. The residents of the barangay, whether with or without children studying in the barangay elementary school are enjoined to do maintenance work in the school premises. The activities usually undertaken are clearing of the surroundings by cutting of grasses, cleaning of the school and the yard, fencing of the grounds, some carpentry work for damage areas, fixing of tables and chairs, planting or re-planting of plants and others. The community members themselves bring the necessary materials and tools needed for the activity, such as brooms, bolos for cutting grasses, bamboo, wood, nails, planting materials, etc. This activity is undertaken by the whole community on a voluntary basis on a specific day set by both parents and teachers. During this activity, the community residents work are free. No free food is provided since the community themselves bring their own packed lunch. The community calls this activity "Tagbo" or "Tagbuan".

From the interview of barangay officials and some members of the community, it appears that the community participation in this activity is almost 100 percent. This is one of the two major activities of the barangay where the "tagbo" is practiced. This is also a form of social gathering for the community as it is in this activity that they come together as one member of the barangay.

ii) Day-Care Center

The barangay council initiated the construction of the day-care center. The fund for the project comes from the IRA of the barangay. The purchase of materials for the construction of the center has already been completed except for the gravel and sand that cannot be delivered to the barangay due to the non-accessibility of the barangay roads. Once delivery of gravel and sand are completed, construction of the center is expected to be started. The barangay council programmed the completion of the center by the end of this year (1996).

iii) Free Flowing Communal Pipe Connected to a Spring

The rehabilitation of the communal pipeline and the construction of the new line to connect to Iba was undertaken by the barangay council. Barangay residents were hired to undertake labor activities for both works. There is no voluntary participation from the barangay community.

Leaks in the pipes are usually controlled by tying with some rubber.

iv) Community Center

The maintenance of the area, that is, cleaning of the grounds, is a regular activity of the barangay officials. When meetings are held, the barangay council with the assistance of their spouses, the barangay health workers and barangay tanods (security police) helps in the cleaning of the area and the facilities.

The collective action undertaken by the community is before the celebration of the barangay fiesta (August 17), where the whole community is enjoined to participate in the cleaning and clearing of the barangay area. This is the second collective activity of the barangay where the "Tagbo" or "Tagbuan" is practiced. A few days before the fiesta activity, the community designates a day when they can do this activity collectively.

v) Barangay Road

Major maintenance of the barangay road is usually undertaken by the municipal office by grading and spreading of gravel. This maintenance work is done once during the dry season. The maintenance work is very superficial. Hence, after the onset of the wet season, the roads become muddy and impassable by any type of vehicle.

The barangay community undertakes community work for road maintenance once a year before the celebration of the fiesta. The activities undertaken during this period are grass cutting, clearing of roads, patching of road holes. During this period the "tagbo" is practiced. At least one member of a household is represented during this group community action. The activity usually last for one whole day. The workers bring with them their tools and food provisions during the work activity.

vi) Barangay Chapel

The chapel is usually maintained by the active church organization in the community, the Cablesilla. It is religious organization formed in the community with the majority of its members composed of women. The chapel is cleaned before Sunday when religious activities as mass is held.

However, before the barangay fiesta celebration, the chapel is also one of the community facility that is subject to general cleaning by the whole community. Thus, when cleaning is done at the barangay center, the chapel is included as a part of the area to be cleaned and cleared thoroughly.

Community Participation and Involvement in Organizations

There are four identified organizations in the community, namely: the Marangog Multi-Purpose Cooperative (MMPC), the Cablesilla (Catholic Pastoral Council), the Parents Teachers Association (PTA) and the Youth Action for Population and Development (YAPODE).

In Marangog Area, the planting of abaca has been re-introduced. With the planting of at least 200 ha of abaca, the farmers were encourage to form an organization to be able to avail a loan from the LBP for abaca production. The MMPC was thus organized by the DAR-DF and the FIDA worker in the Area. However, the organization is composed only of barangay officials and other

barangay residents receiving honorarium or monthly allowance, such as, barangay health workers, tanods, representatives, etc.

The PTA is organized annually by the teachers of the elementary school to provide assistance in the maintenance of school facilities. The organization is very active and is engaged in other barangay activities like beautification program, promotion of school and home garden and school feeding program. The membership of this organization is compulsory for all parents of pupils. However, even parents without children enrolled in the school participate in the school activities.

The other organization in the Area is the Cablesilla, church-related organization composed of Catholics. It has 12 active members. YAPODE is an organization for the youth whose age range from 15-24. This organization is very active during summer vacation. It is primarily involved in sports-related activities. The YAPODE is a municipal-wide organization organized by the Population Commission Office (refer to Table I.2-13).

Traditional Collective Activity in the Community

The Marangog community area has three types of collective or community activity. The terms used by the barangay residents on their collective activity are "Bul-hon," the "Pagtinabangayan" and the "Tagbo or Tag-buan." The first two are considered traditional collective activity of the community (refer to Table I.2-14).

i) On the "Bul-hon"

The "Bul-hon" is a collective activity practiced by farmers in the Area, particularly in sitio of Caimito for the production of corn. The adjoining farms form a mutual agreement to assist one another in the land preparation and clearing of their farm. Usually, about three to ten farmers bond together for this activity. The main activity undertaken is the land preparation and clearing of lands. Each farmer then designates a day when they can work in one farm and complete the rotation of helping each member farmer. During the activity, food is prepared by the owner of the farm. No other payment is provided. This activity of "Bul-hon" is practiced only for corn production since the corn is produce only by the farmers for consumption purposes. The staple food in the Area is corn.

After the preparation of the land, planting activities start. For this activity, the farmer usually plant himself or hires additional labor. However, if the farmer needs labor for this activity and does not have the capacity to hire labor, he can request his Bul-hon members to assist him on a voluntary basis. Compensation for the member who assist in the planting is done during harvest. Hence, the farmer who assists will be given 100 ears of corn for every ganta (2.4 kg/ganta) of seeds planted. The best and biggest corn ears are given as compensation for the voluntary help and given after harvest by the owner of the farm.

Again, the harvesting of the plant is usually undertaken by the owner of the farm. However, if again the same farmer who assisted in the planting will assist in the harvesting activities, additional compensation will be given to him, that is, 111 ears of corn for every 1,000 ear.

For other crops like peanuts and rice, labor is paid for all farm activity from land preparation, planting to harvesting. The reason given by the farmers is that these crops have commercial value and are usually grown for profit. Hence, it is not practiced under the "Bul-hon" mutual assistance.

The collective activity is an opportunity for the farmers to bond themselves together. It becomes a social and economic activity for the farmers involved. Friendships are developed and mutual assistance in other activities is formed, as in times of celebrations and crisis. The same farmers become godmothers or godfathers to respective children in baptism and weddings. They join the same group in community collective actions like road clearing and cleaning, delivery of materials for their day-care center, feeding programs of the school, etc.

ii) On the "Paglinabangayan"

The "Paglinabangayan" is a mutual help program of the barangay community to assist families in times of death. The barangay community has a stand-by fund contributed by each family to be given to a bereaved family. During a death occurrence, the fund is given to the bereaved family during the funeral. Collection for the next fund is done after the funeral. The officials of the barangay and those with fixed income contribute 25 pesos. Other members of the community may contribute between 20 to 25 pesos depending on capability. Every household is requested to contribute. Also, other members of the community give rice or other food on a voluntary basis.

Non-Traditional Collective Activity in the Community

The community usually gather together on the following occasions: barangay assembly meeting called by the barangay; informal meetings called by the barangay council whenever visitors are expected in the community, as in the case of the activities related to the study and when officials from the municipality or other agencies visit the area; barangay consultation initiated by DAR regarding their conceived development plan. Another collective activity undertaken by the barangay is during the fiesta celebration, school opening cleaning, etc. The barangay residents call this practice the "Tagbo or Tagbuan."

The Tagbo or Tagbuan is a voluntary work undertaken by the community as a means to help or assist in community activities. The specific activities cited by the community as forms of "Tagbo" are as follows:

i) Barangay Fiesta Celebration

Every year the community celebrates the fiesta (August 17), which is participated by all members of the community. It is during this time those people from the entire community work together as a group. Young and old, men and women work together to clean, decorate and celebrate the fiesta. Collective activity is undertaken before and during the celebration.

The major activity of the barangay community before the celebration of the fiesta is the cleaning and clearing of the barangay road and the community center and surrounding areas including the chapel. The community actively participates in this group work. Non-participation would result to alienation from the majority of the community. The majority of the participants are the men and the youth. Only very few women participate as the work is mainly men's work. After the work, the men gather and have a drinking session.

The barangay community also cleans the community center and other surrounding areas before the celebration of the town fiesta. The community members designate a day for cleaning participated in by all members. The work is voluntary and the members bring their materials for cleaning and clearing and their food provision.

During the fiesta, the barangay people jointly celebrate the occasion. Foods are prepared in every household. Visitors like government officials from the local government are expected to attend. Baptisms of children and at times' wedding celebrations are held. There are games and dancing during the occasion. This is the occasion when barangay residents spend much of their savings, sometimes even get into debt for this occasion.

The barangay officials and residents interviewed all responded that they have actively participated in this group work activity.

ii) Clearing and Cleaning of Elementary School Grounds and Premises after School Opening

This activity is usually done during the first month of school opening. The barangay residents undergo cleaning and clearing of school grounds and premises; fencing; planting and re-planting of trees, plants, vegetables; fixing of damaged buildings, chairs, tables, etc. The activity is participated not only by parents of the pupils in the school but all members of the community.

iii) After an Occurrence of a Calamity

The Project Area is sometimes affected by typhoon. After the occurrences of a typhoon, some community facilities and houses are damaged. During this period, the community gets together to repair damage facilities and houses, clear the surroundings of fallen trees, and other debris, etc. Work is voluntary and

during this period snack is provided. Big damages are reported and the LGU concerned are requested to provide assistance.

iv) Delivery of Day-Care Center Construction Materials

The Project Area is located about 16 km away from the poblacion of Hilongos. Before reaching the barangay, one has to cross a river that becomes not passable during a heavy rainfall. The barangay road is in very poor condition and cannot be reached by vehicle specially during the wet season. The soil type of the Area is sticky, hence, becomes very muddy that even a two-wheel motor bike cannot pass through it. The barangay residents could not transport anything in Marangog under this condition. They have to use a carabao pulled cart or carry by hand or on shoulder any produce or things they want to bring in or out.

Due to this condition the materials that will be used for the construction of the day-care center have been stacked up at the nearest barangay that is about seven kilometers away from the barangay proper. As a community endeavor, the barangay community through the initiative of the barangay officials took the responsibility of bringing in all the construction materials needed for the day-care center, such as, wood, cement, hollow block, nails, galvanized iron, etc. The barangay residents with some business or transactions in neighboring barangays or at the town proper carry with them materials upon returning. To facilitate immediate delivery they have organized themselves into groups by sitios and decide the day they will have to work together and bring in collectively whatever construction material they can carry. To date, the construction materials have all been transported to the barangay except the gravel and sand that has to be delivered by a truck.

Problem to be solved within the Community

Residents who live near the barangay proper and those along the barangay roads are always informed on the latest happenings in the Area. These members of the community get to attend meetings and discussions called by the barangay council. However, barangay residents living far away from the area not always informed of the current activities in the barangay.

As to the consultation conducted in May 1996 for the proposed JICA assisted project, about 70 percent attended and were informed about the meeting and results of the discussion. The meeting was attended by all barangay officials including the other barangay representatives and members of the community.

During the deliberations in a barangay meeting, the decision process making was based on a majority vote decision. Issues are presented and when disagreements occur, the community decides by majority vote. Disagreements usually center on the day an activity is to be undertaken.

Community Participation in the Development of the Area

The participation's of community residents in the development of the Area are as follows:

- Attend meetings, deliberations called by the barangay council
- Participate in the JICA Study Team surveys
- Respondent/interviewee during the socio-economic survey and other succeeding surveys

The other participation's or involvement's of the community are as follows:

- Join the whole community in the yearly maintenance work of the road,
- Request the LGU to assist in the maintenance work of the road through grading and gravel spreading during the dry months,
- During the consultation held in May 1996, strongly proposed for JICA assistance the inclusion of road rehabilitation in the conceived development plans for the ARC area,
- Continuous follow-up with the LGU (municipal mayor and LEYECO) on the installation of electricity lines,
- Barangay Board Resolution was made this year (1996) for the need to implement electrification of the barangay, and
- Consulted the municipal agriculture office on farm production techniques

The contribution or participation of the people in the community is as follows:

- Voluntary labor contribution
- Provision of food for voluntary labor
- Provide access to lands/properties affected by project without compensation
- Willingness to be trained, if need arises

Special Skills Available in the Area

The municipal government is encouraging the propagation of herbal medicine. A herbal garden was thus put up to encourage mothers to plant herbal medicines. Seminars on the uses of plants for medicinal purposes were taught to the mothers. Dressmaking courses were also conducted in the Project Area. However, for lack of machine and capital, those who were trained were not able to practice what they learned.

b) Assessment and Considerations of Present Condition of Social Capability

- The Barangay council has many programs and project activities for the last two years. They have allocated much of their IRA fund for the development of the barangay. All projects are funded from the barangay IRA fund. This

has become a source of income generation for the community as labor for any barangay construction work is paid from the barangay fund. In all these project activities, no voluntary work is undertaken by the community except the bringing-in of construction materials for the day-care center construction project,

- Since the barangay has five sitios, each kagawad (security police) or councilor is assigned a sitio to care. All community activities are channelled through the representative kagawad. It is the kagawad representative who deals directly with the sitio community. Examples of these activities are: the kagawad informs every member of his area about general assembly meetings, sees to it that members of his sitio attend these meetings, collects and gathers people in his area for any community work like cleaning of roads and the barangay center area, collection and delivery of construction materials for the day-care center project, get people to work on the rehabilitation or construction of the barangay water pipe system, representatives for the fiesta activities, etc.,
- The organizations in the barangay community are formal and informal venue of collective activity that can be tapped and used in the development of the Area. For the Marangog Area, the barangay officials are also the officers and active members of the organizations. These organizations therefore can be the basis for labor mobilization, organization and support,
- There are at least four organizations in the Area. These organizations are very active. However, these organizations are not yet fully organized and matured. The MMPC has newly been organized and its activity is limited to buying of copra and bottles. Since the capital is limited, they stop buying once when their capital is exhausted. The members of the organization are limited to barangay officials and representatives. The other organizations like the PTA and the Cablesilla have also limited activities. However, given the motivation, guidance, and support with extensive social preparation and capability build-up, these organizations can be tapped and used to assist in the sustainability of the projects and activities to be proposed in the Project Area. These organizations can be tapped and developed to assist in the mobilization and implementation of the project activities in the Area,
- The effectiveness of community participation will depend on the collective activity of the community as a whole. If collective activity is not regularly practiced, the community's sense of participation will also be de-limited. Though almost all barangay projects are without community participation, the community has a very strong traditional activity that motivates them to assist and work together. There is already a foundation that can be used as a basis for strengthening and preparing the community to work together for the sustainability of the project to be proposed in the Area, and

- The use and maintenance of barangay facilities and resources by the community will determine the kind of value formation and training that should be emphasized in the development of the Area. The reliance of the barangay officers on their IRA funds for the implementation of barangay projects or activities; the presence and availability of almost complete barangay facilities or utilities; the active participation of kawagad leaders in each sitio is signs of resourcefulness in the community leadership.

9.1.4 Agricultural Conditions

1) Soils and Land Use

a) Introduction

A soil survey the same as that of Sappaac ARC was conducted at a total of 12 representative observation sites. The observation sites were chosen from the areas with different land forms and soil types. The soil characteristics were observed and quick test was made for observation sites. Considering the result of the survey, the soil characteristics of the observation sites are presented in Table F.2-3 and Figure F.2-23 to F.2-30.

b) Landform of Area Surveyed

The following four categories of landforms are identified;

- (i) Narrow alluvial valleys on limestone,
- (ii) Limestone hills, gently sloping to undulating,
- (iii) Limestone hills, undulating to moderately steep,
- (iv) Limestone hills, steep to very steep.

The narrow alluvial valleys on limestone are filled with weathered limestone, which are mainly used for paddy rice. The low limestone hills, gently sloping to undulating are the hilly area with 8-18 percent slope. The elevation is from 160 to 200 m above mean sea level. Few to common rock outcrops and gravel characterize the areas. The low limestone, undulating to moderately steep have slopes ranging from 18 to 30 percent with elevation of 200 to 270 m. The slope of the limestone hills, steep to very steep is more than 30 percent.

c) Soils of the Area Surveyed

The following three soil groups are identified in the Project Area:

- (i) Inceptisols, Vertic Tropaquepts
- (ii) Alfisols, Lithic Paleudalfs
- (iii) Alfisols, Typic Paleudalfs

The Typic Tropaquepts are the wet Inceptisols on the narrow alluvial valleys on limestone. The soil texture is clayey. The natural drainage is poor to very poor. The water table is close to the surface during the wet season. The Lithic Paleudalfs are shallow soils with lithic contact derived from limestone. Soil depth is generally less than 50 cm with clayey texture. The Typic Paleudalfs have a argillic horizon with moderate to high base saturation. The soil reaction is slightly acid to neutral.

d) Present Land Use

The present land use is indicated as follows:

Land Category	Area		Remarks
	(ha)	(%)	
1. Cultivated land			
(1) Rice Land			
- Irrigated	-	-	
- Rainfed	24	7.3	
Subtotal	24	7.3	
(2) Upland	33	10.0	
(3) Coconut and Orchard	115	34.8	Including 17ha of Abaca land
Total	172	52.1	
2. Grasses and Shrubs Land	138	41.8	
3. Residential and Others	20	6.1	Including roads and trails, etc.
Grand Total	330	100.0	

Source: JICA Study Team

The land use by category except residential and others are shown below:

Rice Land

Paddy rice is grown once a year in most of the rice land. After harvesting paddy rice, upland crops such as corn and peanut are grown in the Area. However, it is estimated that second paddy rice is grown in about 50 percent of the total rice land according to the rural socio economic survey. Although parts of rice lands are partially irrigated by spring or small stream water, paddy rice are also grown in rice land fed by rain. However, crop production is quite unstable.

Upland

Corn, peanut, sweet potato, cassava and upland rice are the main crops grown in the upland. These uplands are mostly located in the undulating to rolling area, on the soils of the Typic Paleudalfs. Low soil fertility and high erosion hazards do not allow the wider introduction of upland crops in the Area.

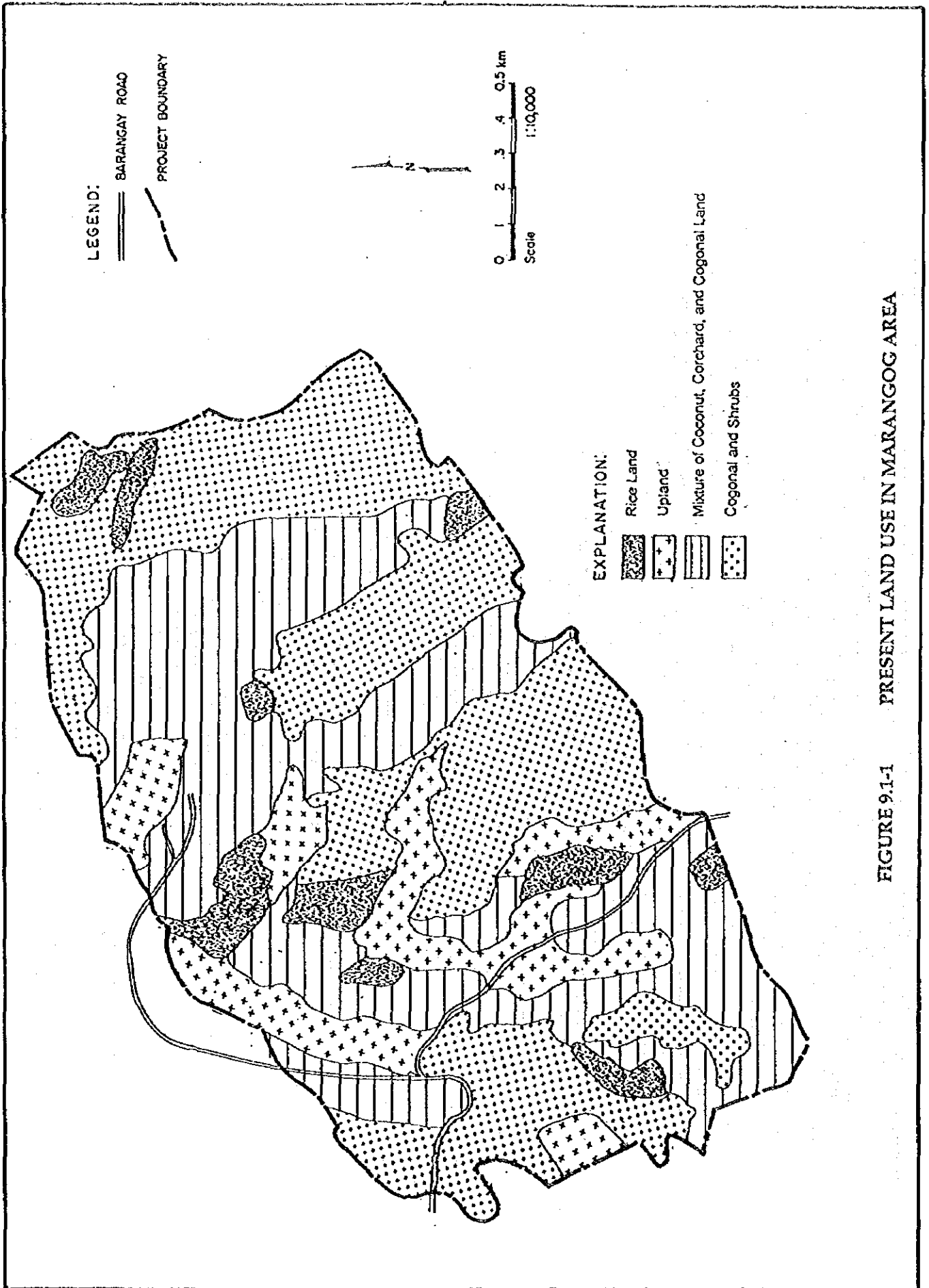


FIGURE 9.1-1 PRESENT LAND USE IN MARANGOG AREA

Coconut /Orchard Mixed with Grasses and Forest

About 50 percent of the area is covered with coconut, abaca and orchard. These are mostly located in the undulating to rolling limestone area or on the steep valley sides. Under the coconut trees, limited pastures are extended.

Grasses/Shrubs and Forest Land

This category of land covers about 42 percent of the Project Area. These are located in the undulating to rolling, steep to very steep limestone hills and valley sides. The most common grass species are cogon.

2) Crop Production

The total gross cropped area per year is estimated at 214 ha as shown below:

Present Crop Production

Land/Crop	Area (ha)	Unit Yield (ton)	Production (ton)
1. Rice Land			
Wet Season			
- Paddy	24	0.5	12
Dry Season			
- Paddy	14	0.5	7
- Corn	10	0.4	4
Sub-total	48		23
2. Upland			
Wet Season			
- Root Crops (Sweet Potato ^{*)})	13	2.0	26
Dry Season			
- Corn	26	0.5	13
- Beans (Peanut)	7	0.5	4
Sub-total	46		43
3. Coconut			
- Coconut	86	0.5	43
- Corn	3	0.5	2
- Beans (Peanut, Intercropped)	2	0.5	1
Sub-total	91		46
4. Orchard			
- Banana	12	2.2	26
- Abaca	17	0.3	5
Sub-total	29		32
Total	214		143

Note: The crop in the parenthesis shows the respective representative crops.

*1 : including gabi and cassava

Source: JICA Study Team

The cropping intensity is accounted at 64.8 percent to the Project Area or 124.4 percent to the total cultivated as follows:

<u>Cropping Intensity</u>	<u>Intensity(%)</u>
Total Project Area (330ha=100%)	64.8
Total cultivated area (172ha=100%)	124.4

The grass and shrubs' land cover 42 percent of the total Project Area. Most of these lands have not only steep terrain but also have soil problems as shallow top soils, gravel and rock outcrops.

The climate of Marangog falls under the Type IV climate in the Philippines, where rainfall is approximately evenly distributed throughout the year. Even under this climatic condition, the cropping intensity to the total cultivated area is as low as 124.4 percent. Large areas of fallow land appear in the upland during wet season due to very poor drainage. Sticky clayey soils covers the entire Project Area. This causes the poor to very poor drainage almost throughout year.

Coconut, banana and abaca are left to grow extensively in areas with 18-30 percent slope. Despite various negative factors associated in the production of cereal grains, most farmers expressed strong interest to produce rice and corn. This may relate to the short supply of staple food in the Area.

The unit yields of the major crops are considerably lower than the national averages. These can be attributed to the poor soil conditions in the Area and the strict adherence of most farmers to traditional cropping system.

3) Farming Practices and Input Supply

Marangog farmers generally apply traditional farming practices in crop cultivation. Lands are prepared by using draft animals. However, there are a considerable number of farmers with no draft animals. These farmers prepare the land by sharing the draft animals owned by other farmers. Local and low yielding paddy rice and corn are dominantly grown with very limited amount of fertilizer applied despite their knowledge on the poor fertility of the soils. Lack of capital is one of the major reason why farmers avoid the use of adequate farm inputs.

The accessibility to the Area is so difficult that the municipal agricultural technologists visit the Area irregularly. Therefore, technology transfer and farm input supply are limited. Only some vegetable seeds are distributed by the municipal agricultural office of Hilongos. However, the municipal agricultural office has a plan to provide assistance in the establishment of small scale barangay nursery, and the release of tilapia and carp fingerings at the Cawa river.

4) Animal Husbandry and Inland Fisheries

a) Animal Husbandry

- According to the agro-economic survey conducted by Study Team, 85 percent of farmers have carabao with an average of 2.1 carabao per family. For cattle, ownership is 14 percent with an average of 0.2 cattles for family,
- At present, the common means of transportation are the large animals like carabaos and cattles. These are used to carry agricultural products to the nearest market and to carry back the goods bought from the same nearest market. Due to small size and low body weight, the local cattle is not strong working animals,
- The health status for animal husbandry around the Project Area looks good. The Area is isolated and properly protected against all kinds of intruders, hence no animal and poultry diseases causing organisms can enter by way of animals or humans,
- Most farmers keep carabaos for their power needs while others hire surplus draught animals. The large hooves and great flexibility of the pastern and fetlock joints enable the carabao to work with ease in thick, muddy, waterlogged field. Carabaos are slow as compared with oxen for traction but can draw much heavier loads and have greater staying power,
- Goat raising forms an important and integral part of small holders. Like carabao farming, goats have also been a traditional form of livestock activity in the Project Area,
- Regarding pig sector, the present breeding stock is gradually degrading due to inbreeding. Although these animals are slow growing, they have the outstanding ability to thrive under hot humid climate and under poor nutritional and management conditions which they are usually reared,
- Traditional chicken raising is common in the Area. Each family keeps a minimum of four to five laying hens for egg and meat production. Native chickens are continuously raised because of its versatility and high market demand. Most of farmers sell their chicken products during the market day at the nearest barangay. Duck raising is not a widespread in the Area, and
- Animal raisers have not been granted adequate incentives, thereby discouraging people from investing into livestock raising.

5) Marketing of Agricultural Products

At the regional level, the farmers in Region VIII market the following percentage of their farm production and use the rest for consumption or payments

for various services or loans: aquaculture fish (86%), caught fish (85%), coconut (84%), banana (63%), corn (53%), sugarcane (43%) and palay (32%).

At Marangog, almost all farmers market some of their produce both within and outside the Area. Of these, the favorite marketing outlets used by 96 percent are the local traders. The others market their produce directly to the consumers.

The six major crops marketed by the farmers at Marangog Area are copra, abaca fiber, white corn, peanut, banana, and palay. Others include cacao and livestock products, the farm prices of which in September 1996 are listed below:

- Paddy : 8.75 peso/kg or 350 peso/cavan v.s. 7.58 P/kg
- White corn : 7.50 peso/kg or 300 peso/cavan v.s. 5.40 P/kg
- Peanut : 7-8 peso/kg or 350-400 peso/bag unshelled
- Banana : 30-40 peso/100 pieces
- Mango : 10-20 peso/kg
- Coconut : 7-11 peso/piece v.s. 8.70-8.97 peso/kg copra
- Abaca : 12 peso/kg v.s. 24 peso/kg from survey
- Cacao : 50 peso/kg
- Carabao : 4,000-13,000 /head
- Cattle : 3,000-7,500/head
- Pigs : 1,000-6,000 peso/head v.s. 630-1023 P/kg
- Chicken : 12-40 peso/bird v.s. 63-65 P/kg of broiler/native chicken
- Chicken egg: 3-3.50 peso/piece for native and other breeds
- Goat : 400-500/head v.s. 372 P/hd

As to transportation, the poor farm-to-market roads at Marangog Area seem to be the worst of all four Areas. During the wet season, only motorcycles can reach up to certain points of the Area. The road is rough, slippery and sticky. Carabaos with sled are seen hauling abaca fiber and other farm produces to the barangay proper and barangay Concepcion.

6) Research and Extension

a) Research Organizations and Their Activities

Research organizations that will support agricultural technology in Marangog Area are Eastern Visayas Integrated Agricultural Research Center (EVIARC), Babatngon Research & Outreach Station, Malitubog ROS, Salcedo ROS and Visayas College of Agriculture (ViSCA, Baybay). Materials dealing with and the activities in these organizations are as shown in Table II.2-4.

b) Technology Extension Agencies and Their Activities

Regional DA, PAO, MAO, EVIARC, ROSs and ATI have technology extension activities. The technology developed at research agencies are directly or

indirectly transferred from the regional DA and the research agencies to PAOs, MAOs and farmers through techno-demo farms and training.

MAO, Hilongos has carried out Phil-Rice Techno-Demo Trial on varietal adaptability, integrated nutrient management, water management and integrated pest management on rice, and promotion and dissemination of improved technology on animal production, health care and disease management.

The front works of technology extension are left to MAO's field technologists (extension workers). The numbers of technologists at MAO Hilongos are nine who covers 5,882 farmers within 51 barangays with an average of 654 farmers in six barangays per extension worker.

ViSCA located at Baybay has its extension program with the aim to strengthen the capability of the National Government Officers, LGUs, POs, NGOs and farmers. The major extension subjects are (i) integrated root crop extension, (ii) integrated abaca extension, (iii) integrated coconut delivery system, (iv) integrated extension program on horticulture, (v) integrated pest management for major crops, (vi) crop and soil management for sustained production, (vii) integrated livestock and poultry development program, (viii) appropriate upland farming technologies, (ix) small-scale agribusiness enterprise management and (x) Philippines carabao program.

Training of the staff members of LGUs and farmers has been carried out by such agencies as ATI, EVIARC, ROSs, PAO and MAO at their training facilities. In 1992, EVIARC had 29 technical training and five non-technical training courses for the staff members of ROSs, LGUs and farmers (EVIARC Report, 1992). While ViSCA had 24 training in 1995 composed of five training's in reforestation farming, two in handicraft, three in farm record keeping, booking, accounting and auditing procedures, one in ornamental plant, one in cassava cookies, three in values reorientation, one in cattle fattening, one in cooperative development, one in extension and two in leadership. ViSCA also had training in 1995 in abaca production, by-product utilization, processing and handicraft making for 391 participants (Extension Highlight, 1995, ViSCA).

c) Seeds/Seedlings Supply Agencies

PAO, MAO, DENR, EVIARC, ROSs and ViSCA provide seeds/seedlings to farmers. MAO, Hilongos produced 27,650 kg of certified rice seeds (IR 60) with use of private seed farms, 53,000 vegetable seedlings at municipal and barangay nurseries in 1994/95 and distributed to farmers.

EVIARC and its ROSs assist farmers and fishermen in providing seeds, seedlings and fingerlings. In 1992, EVIARC distributed around 20 percent of the total seed production, plant materials and fingerlings for free, and offered the seedlings of quality stock of plants and animals at 30 percent lower than the current market price.

7) Agricultural Credit

The farmers at Marangog Area have been borrowing credits for their farm production. Their average size of loan is 972 peso per household.

Nevertheless, the only type of agricultural loan ever borrowed by the ARBs at Marangog Area is that for coconut. Nearly half (44%) of those who grow coconut have availed of the loans. Almost all (88%) borrow them from the merchants. The rest borrow them from relatives and commercial banks. Most borrow less than 5,000 peso each. What is impressive about Marangog credit performance is their small number of outstanding loans (18%).

A review of data earlier collected during the phase-I study reveal an interesting fact. The average household in the Area has experienced a dissaving of 12,462 peso per household. As interpreted in the case of other Areas, the amount indicates a large amount of credit needed by the ARBs at Marangog Area.

Credit Utilization at Marangog and Areas

Areas	Self-Finance(%)	Borrowers (%)			Ave. Loan (peso)
		Formal	Non-Formal	Others (%)	
Sappaac	82	-	2	6	16
Cofcaville	4	38	70	0	4,874
Marangog	56	10	40	0	972
Silae	36	4	46	14	3,794

Credit Requirement at Marangog and Three Areas

Area	Income			HH-Expense	(unit : peso)
	Farm	Non-Farm	Total		Saving/ Dissaving
Sappaac	1,688	14,738	16,426	12,929	3,497
Cofcaville	26,845	4,492	31,337	38,632	-6,295
Marangog	3,508	1,563	5,071	17,533	-12,462
Silae	19,746	1,301	21,047	22,797	-1,750

9.1.5 Irrigation Water Resources

1) Available Water Resources

Although many creeks and small spring exist in Marangog Area, stable water resources that can be used for irrigation are not available. This is because of its prevailing topographic conditions in the Area. Most of crop cultivations' is undertaken by rainfed farming due to the availability of adequate rainfall throughout the year. When it rains, creek water is diverted in each field through the simple diversion structures temporally constructed.

2) Potential Water Resources

The Marangog creek located outside the Project Area, that is one of tributaries of the Salug river, has water flowing from north to south at the eastern part of the Marangog Area. This creek has relatively abundant run-off discharges even during the dry season. Therefore, the discharges at the Marangog creek could be used for irrigation purpose with the provision of adequate intake and delivery facilities.

9.1.6 Agricultural Infrastructure Conditions

1) Irrigation Condition

As mentioned above, water supplies for cultivation are sourced from small spring and creeks diverted to the farms. However, these types of water supply are unstable. Predominant crop cultivation is still undertaken under rainfed condition. Therefore, beneficiary farmers are requesting stable irrigation water sources.

2) Drainage Condition

According to the field survey, existing fields, especially during the wet season, are always under poor drainage condition in spite of sloping topography. This poor drainage condition is caused by clayey soil texture in the Area and the absence of farm drain.

3) Farm Land Condition

Most of farm lands in the Area are planted to coconut and upland crops such as corn and peanuts during dry season, and paddy fields located in low-lying portions. These upland fields have gentle slope from north to south. Contour farming has been practiced at the upland fields. However, special countermeasures for soil erosion are not undertaken at present.

4) Farm Road Condition

Farm roads are not available except for foot-path in the field. Therefore, hauling of input material and crop products are done manually or by using carabao with very simple cart. Under the situation, local people have not only unfavorable conditions for farm activities, but also communication among barangay in and around the area.

9.1.7 Rural and Social Infrastructure Conditions

1) Rural Roads

There are two roads to access Marangog Area from Hilongos by way of barangay Conception. One is the barangay road through Bagumbayan and Sta. Margarita with a total length of about 12 km. The other is by way of Tagnate with a total length of about 10 km. Both roads are not properly maintained and without pavement. It is very difficult to pass through these roads even with the use of 4-wheel drive vehicles, especially the sections from Sta. Margarita to Marangog and from Tagnate to Marangog Area.

The above mentioned two roads function not only as access to Marangog Area but also as farm-to-market roads within the vicinity. Therefore, rehabilitation of these roads will be essential for the Area.

2) Rural Water Supply

The source of rural water supply in Marangog Area is a spring located at about 450 m north-west of barangay proper. It was constructed in 1963 using national fund. The system is a Level-II system with communal faucets. It is serving 54 houses in two sitios, barangay proper and sitio of Iba.

The spring water discharge is about 1.0 lit./sec. A part of the discharge is used for irrigation purpose for three hectares of paddy fields next to the spring. The water distribution for the two barangays and irrigation purpose is made of concrete box structure 1.2 m in width and 1.0 m in height.

To maintain the water quality of the spring water, the barangay health worker chlorinates the water every month (five spoons/month).

3) Rural Electrification

Marangog Area is not electrified at present. However, according to the information obtained from Leyte Electric Cooperative Inc. (LEYECO-IV), power line construction to Marangog Area is scheduled in 1998 through the connection of electric line from barangay Tagnate under the "Rural Electrification Project" funded by OECF. Presently, construction works of power line from barangay Sta. Margarita to barangay Tagnate are under progress with single phase line under the LEYECO-IV.

4) Other Rural and Social Facilities

The facilities and utilities of the barangay are as follows: complete elementary school (three buildings with 10 rooms; 2 buildings are under poor condition while one building has been newly constructed); day-care center activities but without building (at present using the second floor of the barangay

hall); free flowing communal pipe located at the barangay proper (2) and at sitio Iba (2); spring with improvement (intake tank with two hose/pipes connected to the barangay); a community center with the following facilities: barangay hall (two stories with an area of 40 sq. m.); auditorium; small warehouse; multi-purpose pavement; basketball court; barangay chapel; barangay road. The social facilities and services are mostly concentrated in one cluster at the center of the barangay proper. Since the barangay has no high school and/or college education facilities, they are availed at barangay Concepcion or at the town proper of Hilongos or in Baybay, Leyte or Tacloban City.

When the day-care center was established in the barangay, it has no specific area or center. It was first conducted in the barangay chapel. In 1992, its activity was transferred to the health center. However, the health center is made only of light materials and was abandoned after it was damaged in 1995. The center is now temporarily housed at the second floor of the barangay hall. The barangay area has a spring that was tapped for domestic water use. An intake tank was constructed at the spring source and from there a pipe and a hose connected to the barangay proper and Iba, respectively, was installed. The pipe connections are free flowing for the use of the residents of the barangay. The barangay community center is located at the barangay proper with aforementioned facilities. The center is surrounded by residential areas within the barangay. The roads are narrow, very stiff and becomes muddy due to very sticky type of soil during the wet season.

The Area has no health center. It uses the health center facilities of the nearest barangay in Concepcion. A midwife visits the area at least twice a month since the midwife is also serving three other satellite barangays. The services provided by the midwife are limited to delivery calls and immunization programs. By this reason, the farmers avail themselves of the services of the local doctor, the "arbularyo." For serious illness or other health related services, the residents avail of the facilities in the poblacion/municipality.

9.1.8 Farmers' Organization and Their Activities

1) Farmers' Cooperatives

a) Marangog Farmers' Multi-Purpose Cooperative

There is a farmers' cooperative named "Marangog Farmers Multi-Purpose Cooperative" in the Project Area. The cooperative was organized in 1995 by the initiation of FIDA and DAR development facilitator. The farmers' were encouraged to organize so that they would be able to get loan from LBP for Abaca production. However, the cooperative is not planning to secure a loan at present, since they are not fully organized yet. The members have already drafted their by-laws and constitution and is being reviewed by FIDA. The cooperative intends to register with the Cooperative Development Authority in 1996.

The present number of membership is 36 (ARBs: 36) or 18 percent of the total farm households (196 households) in the Marangog Area and is 28 members or 19 percent of the total farm households (144 households) in the Project Area. The cooperative members are recruiting new members. However, increase in the membership number is difficult because all members of the cooperative are composed of barangay officials (eight persons) and others (10 of barangay health worker, 13 of barangay Tanod, five of barangay sector representatives) receiving honorarium from the barangay council (1,000 pesos per month for the barangay captain while the barangay councilors, 600 pesos per month).

Activities of the Cooperative

The cooperative started buying and selling copra and empty bottles in July 1996. To undertake this activity, the cooperative assigned a manager and an assistant. Copra products are bought from members and non-members at eight pesos per kilogram then re-sold to the buyers at 8.70 pesos. The bottles are bought at three bottles per one pesos and re-sold at 0.6 pesos per piece. The copra and the empty bottles bought by the cooperative are temporarily stored in the barangay warehouse, while awaiting for pick-up by the trader. However, the cooperative only sold once in July 1996 as the traders do not have access to the Area due to bad road conditions. Since the cooperative has only a very minimal capital, about 3,000 pesos, they stopped buying copra and bottles. The persons in charge of this project are given an incentive of five percent from the net profit.

The cooperative has a plan to increase membership to farmer residents not receiving honorarium, and to expand cooperative services such as consumer store and loan services to members.

Information for the Development of Cooperative Activities

The farmers in the Area scarcely have any economic activity. The only way to obtain cash is selling fruits within the barangay or at barangay Conception market opened twice a week. Food for the residents is insufficient, which becomes serious during December to May.

Production technology is introduced through MAO extension worker who visits once a year, MARO development facilitator (once a week) and farmers' training. Training so far received are pre-membership education seminar and skills training on abaca handicraft.

Support services strongly required for their farming are activities access road to market with bridge and barangay road, fund for farmers cooperative to buy copra and abaca and transportation vehicle for products and persons.

2) Other Community Organizations

Besides the multi-purpose cooperative, there are three other identified organizations in the Area as shown in Table I.2-13. The PTA is very active and has other projects in the barangay and is not only concerned school-related activities. An active youth organization also exists in the Area.

However, these organizations still lack the capability to expand and improve their resources. These organizations can be developed and tapped and can be an important basis for mobilization and support in community projects.

3) Women in Development

Women participation in the barangay community in terms of organization participation are as follows:

- Two barangay council members are women,
- The majority of the Cablesilla organization members are mostly women,
- Women participate in all activities of the barangay, such as the road and maintenance work, cleaning and clearing of the barangay center before the fiesta, cleaning and clearing of the school premises, and
- The participants for the school feeding program are women (99%).

The general services/facilities catering to women are as follows:

- Day-care center: Women are given the opportunity to do other work/activities during the time that the children are at the center,
- Family planning information is available at the barangay through the barangay population worker,
- Immunization services for women and children (once a month),
- Information on herbal use through the midwife and the barangay health workers (a barangay herbal garden was established in the barangay for this purpose), and
- Training on dressmaking was provided once by the MSWD, however, the skill was not put into used because of lack of sewing machine.

The constraints in the participation of women in community activity are:

- Child rearing work,
- Lack of time due to household work, and
- Since their husbands are already involve, they do not join anymore.

4) Non-Government Organizations

There is no NGO working in the Area. However, there are three identified NGOs working with DAR on the development of ARCs within the region. The programs and services of these NGOs are community development and

organizing, capability building seminars, cooperative development, monitoring of government projects, etc. One of the identified NGOs is interested to work in the Project Area. Refer to Table I.2-15 on the profile, programs and services, and plans and programs of the NGOs within the Project Area.

9.1.9 Post-Harvest and Rural-Agro Industry

1) Post-Harvest and Rural Agro-Industry Conditions

In Marangog Area, there are rice planted in an area of 38 ha, corn 77 ha, legume 9 ha, root crops 13 ha, coconut 86 ha, banana 12 ha, and abaca 17 ha (refer to Table K.2-7). Almost all farming works are performed manually among which manual harvest is popular. Crops that should be dried are exposed to sunshine on the field because of the absence of other drying facilities in the Area. There is one multi-purpose dryer that needs repair. As much man-power for planting and harvesting works is necessary, some farming families hire labor, mostly their relatives or neighbors for reducing long and heavy works (refer to Table K.2-1).

Rice, corn, coconut and banana are the major crops in the Area, and their productions are 19, 37.5, 43 and 26.4 tons per year, respectively. However, there is no post-harvest or agro-processing facilities in the Area except one multi-purpose dryer. As the yield and production of other crops are low, no agro-industry and processing facilities even agricultural machinery is found.

As the marketing places are far from the Area, farmers usually sell to the local traders in and around the Area at farm gate without processing. There is a market in the municipal poblacion. However, the distance between the Area and the poblacion is 16 km traversing rough and undulating roads and crossing a wide river without bridge. It is therefore difficult for farmers to sell their crops to the market by themselves (refer to Table K.2-2 and K.2-3).

Survey for willingness and skill of rural industry/handicraft shows that less than half of householdss are willing to engaged in agro-industry and processing activities compared with the few persons with skills (refer to Table K.2-4). They have high intentions for mushroom production, coconut oil extraction and coconut charcoal making. However, almost all persons have no adequate skills.

Near the Area, though major crops are rice and corn, no special agro-industry and processing facilities are found except for rice milling facilities. However, there are a few manufacturers and distributors of agricultural machinery in the coastal towns. Some abaca traders along the main road have warehouse and facilities to treat abaca strings to obtain high quality abaca fiber. The Department of Trade and Industry (DTI) have been conducting training program for coco-charcoal making. The training was conducted in at least 14 places but in Leyte only and none in the Project Area (referred to Table K.2-18).

9.1.10 Rural Environment and Public Health

1) Soil Erosion

Typic Paleudalfs with 8-30 percent slopes, the most extensive soil is severely eroded. Table P.2-23 shows the estimated soil erosion using the modified Universal Soil Loss Equation. The estimated soil erosion rate within this slope range is very high both with upland crop's cultivation and in overgrazed cogonal area. The values are comparable to the estimated soil erosion within the Pantabangan Watershed (David and Collado, 1987).

The occurrence of typhoon and high rainfall erosivity together with planting of row crops like corn with very limited ground cover contributed to high soil erosion (Table P.2-1). About 90 percent of the Area is rolling to very steep and about 40 percent is covered with grassland and shrubs. The shallow soil of the upland farms is the cumulative effect of soil erosion over time. About 24 percent of the farmer respondents reported that soil erosion and landslide occurred in their farms in the last five years (Table P.2-3).

Some selected farmers from Hilongos settlements attended training on SALT at Baptist Rural Life Center in Kabansalan, Davao Del Sur. However, they have not started putting into use the ideas learned in their farms. No Marangog farmers attended the training. Training on SALT, rapid composting and small water impounding has not been offered to the farmer beneficiaries. Some farmers on the bouldery corn farmlots piled the rocks in their field in a linear pattern but not along the slope.

The Development Facilitator and the Agricultural Production Technician assigned in Marangog Area are planning to hold training on SALT and rapid composting for the farmers.

2) Water Quality

The shallow artesian well has no adequate cemented flooring around the pump. Poor surface drainage and the formerly leaking plastic and bamboo pipes from the spring are the sources of the pollution of the drinking water. Table P.2-4 shows the occurrence of water-borne diseases associated with the free flowing level-II water supply system before the repair of the distribution lines. Even though the leaking pipes have been replaced, low population of coliform bacteria was present during the field test for Coliform in the drinking water on October 15-16, 1996. However, the water is safe for drinking (Table P.2-22). Chlorinating of the spring water and protection of the spring from animal and human waste pollution would be needed. The artesian well in sitio of Caimito has relatively high population of Coliform but still below the critical level. Protection of the source and the distribution systems and water treatment are necessary to ensure safe water supply.

3) Flora and Fauna

About 60 percent of the Area is grassland with cogon (*Imperata cylindrica*) or species and patches of shrubs like hagonoy (*Chromolaena odorata*). The grassland is used as pasture for carabao and cattle. Most of the area has been opened for cultivation except the very steep slope along the creek and on the rocky crest of the hills. Most of the remaining patches of forest trees consist of dita (*Alistonia escolaris*), alibangbang (*Ptilostigma labaricum*), binayoyo (*Antidesma frutescens*), kanbag (*Broussonetia luzoniensis*), kakawate (*Gleiciridia sepium*), bignay (*Antidesma bunius*), talisay (*Terminia catappa*), bamboo (*Bambusa blumeana*), ipit-ipil (*Leucaena leucocephala*) and dapdap used as shade trees for abaca. Trees for construction of houses and rattan for making basket are obtained from the forest area at the boundary of the adjacent Barangay San Antonio, a forest land. Buri is made into bags for corn and rice. Cogon leaves are being pulled and bundles when mature and used as roofing material. This is also sold at 5.00 pesos per bundle.

A small barangay nursery with seedlings of mahogany and gmelina is established at Barangay Proper. Tree planting activity was started by planting trees along the barangay road. The community prefers gmelina, mahogany, and narra for planting (Table P.2-6). They willing to learn various agroforestry production systems but they need skills' improvement (Table P.2-7). The ViSCA-GTZ Program on Applied Tropical Ecology can provide some seedlings of fruit and forest tree species and resource persons on the training on environmental management including agroforestry and watershed management. The DENR-PENRO is also very willing to provide technical assistance on forest conservation and environmental management and delineation of the watershed of the river.

Native and improved varieties of lowland rice, corn, and coconut are raised by the farmers (Table P.2-8). The variety of native white corn is grown mainly for food. Mango, jackfruit, avocado, santol, tamarind, guyabano, caimito, guava, papaya, rimas, siniguelas, coffee, achuete, malunggay and others in the home garden. Squash, ampalaya, string bean, mungo, lima bean, eggplant, pechay, upo, and patola are the common vegetables raised by the farmers. Sweet potato and cassava are the commonly grown root crops. In the Marangog Elementary School bio-intensive gardening it is taught to the pupils. They can grow onion, pechay, and other leafy vegetables that they can do at home.

There no endangered wildlife in the community. Domesticated animals, common birds, butterfly, dragon flies, bees, golden snails, and insect pest are the common terrestrial animals (Table P.2-9). A fine of 25 pesos/head is imposed for strayed pigs in the community. The outbreak of foot and mouth disease last year, severely affected the carabaos and pigs raised by the farmers. Every year Avian pest affects the backyard poultry raising.

Two farms have small fish pond of 3 x 5 m in size and raised tilapia and mudfish. "Aguok" and catfish are caught from the creeks.

4) Public Health

About one third of the children is malnourished but the occurrence of third degree of malnutrition is very low (Table P.2-10). During lean months, December-May, poor families depend mainly on root crops. Subsistence level of the ARC community has to be improved. Variety of local food crops that are easy to grow like winged bean, pignon pea, and other vegetables to overcome malnutrition problem has to be introduced.

According to the Municipal Health Officer, only 30 percent of the households has toilet. The poor disposal of human waste is one of the elements to the pollution of source of drinking water and occurrence of water borne diseases like diarrhea, gastro-enteritis, amoebiasis, dysentery, and typhoid fever. The Office of the Municipal Mayor distributed 13 units of water sealed toilets in summer, 1996. The Sanggunian Barangay of Marangog has appropriated 9,000 pesos for the construction of public toilet in the strategic places of the barangay.

Immunization for tuberculosis, diphtheria, pertusis, tetanus, and polio was provided to the children except for hepatitis and measles (Table P.2-11). Midwife from Barangay Concepcion comes every month for the immunization program. Absence or incomplete immunization of the children to these diseases would predispose them to serious health problems. The barangay health center needs basic medical equipment, facilities, and medical supplies.

Diseases of the respiratory and digestive systems are commonly affecting the children and other members of the community (Tables P.2-12 and P.2-13). Diarrhea, influenza, pneumonia, upper respiratory track infection, and muscular skeletal diseases are the common causes of morbidity. The first three diseases are the leading causes of morbidity in the locality. Gastro-enteritis sporadically occurs in September-November. The poor disposal of human waste and the polluted drinking water from shallow wells and springs are the elements to the occurrence of diarrhea, gastro-enteritis, amoebiasis, dysentery, and typhoid fever.

Improving the diversity of crops in the home garden will provide the nutritional needs that would enhance the resistance to these diseases. Planting of medicinal plants should be promoted to have a ready available source of medicine when the common diseases occur at the household. The annual medical expenditure is very low (Table P.2-14).

Some leading causes of mortality are tuberculosis, severe pneumonia, and heart disease (cardiovascular disease and myocardial infection) (Table P.2-15). Measles and pre-maturity are the major cause of mortality among children of five years old or younger. Improvement of the environment and health conditions of the agrarian reform beneficiaries must be sustained while improving the productivity of the livelihood production system.

The use of pill, condom, and intraurinary device is the commonly offered family planning services by the Municipal Health Office and is accepted by the community (Table P.2-16). Rhythm method is 30 percent effective. The DSWD provides training on population education for the community. Family planning program must be sustained to sustain the carrying capacity of the Area.

9.1.11 Present Problems, Constraints, and Development Potentials

1) Present Problems and Constraints

a) Agriculture

- The average farm size is considerably small at 1.34 ha per farm household, including 0.56 ha of idle/uncultivated land,
- The present cropping intensity to the total land is as low as 64.8 percent or 124.4 percent to the total cultivated land,
- The major sources of staple food are rice and corn. Due to the limited cropping Area and the low yield of these crops, almost all people in the Area suffer from deficiency of supply of staple food. The unit yields of coconut and abaca, which are main sources of cash income in the area are also very low as compared with the regional average, and
- There are many factors that contribute to the low cropping intensity and low yield. Among them, poor roads with steep and rolling terrain, infertile soils and limited extension services and other supporting services are considered to be most significant. The very sticky soils and nitrogen and phosphorus deficiency are severe throughout the upland area. Zinc deficiency is commonly observed in soils derived from limestone. There is therefore the need to analyze the soils to solve the problem.

b) Agricultural and Rural Infrastructures

- There exist scarce water source, absence of irrigation facilities and farm road, and poor condition of barangay road as farm-to-market road,
- There are inadequate rural water supply facilities even with the presence of level-II system with spring water source, and
- The Marangog Area has no barangay health station. The health services are mostly availed in the poblacion and in the nearby barangays where medical equipment and facilities, and medicines are also inadequate. The most pressing problem for the medical personnel, specially the midwife is bad accessibility to the Area. On the other hand, that for the beneficiaries, is the

inaccessibility to the health services due to the bad road condition and absence of regular transportation facilities.

c) Agro-Economy

- Depending on only a few crops as their major source of income, most farm families in the Project Area are subject to large risk and uncertainty caused by unforeseen natural hazards and variations in the marketing and prices of their produce. Integration of production and income from other sources both farm and non-farm would help lessen this risk and uncertainty,
- Unfavorable farm road conditions, while posing problems in other social activities, are the largest problems and constraints to the agro-economic development of Marangog. Improved farm and feeder roads will not only facilitate and increase production but also help boost marketing of agricultural products that is the major source of income in the Area.
- All the unsolved hardships in the past production and living conditions of the people of Marangog Area have left them with fewer resources, in particular capital, to invest enough in their agricultural production. All sorts of development being planned for the Marangog Area would go in vain unless sufficient credits are also made available to them to supplement their small capital,
- The newly established cooperatives are still very weak and need to be strengthened to assume the role of credit and marketing facilitators for all economic activities in the Area, and
- The potential of Marangog Area and its people to venture into productive non-farm activities are at present limited. Provisions of information on new non-farm opportunities and training to help prepare them for such opportunities are needed.

d) Animal Husbandry and Fishery

- There are about 20 percent of the total farm households without carabao according to the rural socio-economic survey in Phase I study. These farmers have to share carabao with the farmers who have surplus number of carabaos, which cause delay in land preparation. Under the rainfed condition, it is necessary to plant crops on time to attain favorable yield, and
- Services on vaccination and any other technology on breeding of livestock and poultry are not available in the Area because of inaccessibility.

e) Farmers Organization and Agricultural Extension

- The existing organization, specifically the cooperative has very limited membership and is composed only of barangay officials and representatives. Since the cooperative is newly organized, it has very limited business activities. The cooperative members and officers still lack the necessary training, capital and skills to manage a business enterprise,
- Most of women want to join organizations to be able to get opportunities for self-employment activities or small business. However, their efforts are obstructed by domestic works, problems of obtaining credit and land tenure and lack of education and skills, and
- The LGU and other support agencies have similar problems, such as, lack of funds, personnel, equipment and field operation facilities.

f) Post-Harvest and Agro-Industry

- Available markets are limited and far from the Area and their roads are rough and inconvenient. Therefore, agricultural products can not be sold at proper prices,
- Appropriate training and support can not be obtained from the government and agencies concerned.
- Farmers have low income and low budget for investment. Loan from the banks requires much paper work. High bank interest and mortgage necessity prevent the farmers from obtaining loan,
- High cost input and low input application result to low productivity, that would lessen the investment for post-harvest and agro-industry,
- As the farm gate, prices are determined by the buyers without any proper quality check. Farmers are not conscious of quality control, and
- High selling prices fluctuation between harvesting and off season. Prices during harvest season are rather low.

g) Environment and Rural Life

- The environmental constraints and problems to the sustainable development of the Marangog Area communities are the occurrence of moderate to severe soil erosion, typhoon hazard, denuded upper watershed, clearing of the stream corridors for crop production, loss of genetic resources, pollution of the drinking water, occurrence of water-borne diseases, poor public health conditions of the community, malnutrition of the children, inadequate supply of locally grown nutritious food crops,

occurrence of lean month, high population growth rate, improper disposal of human waste, and lack of raw materials for handicrafts, house construction, and furniture making.

2) Development Potentials

a) Agriculture

- Through exploitation of the perennial stream water in the Project Area, supplemental irrigation for paddy rice during wet season and irrigation for high value crops of vegetables as squash shall be promoted to increase rice production and to generate income,
- The nitrogen and phosphorus deficiency are severe in the upland areas. The application of nitrogen and phosphorous with organic fertilizer will improve crop production in the Area. The planting of green manure crops, nurse trees, hedgerows and forest trees may supply adequate sources of organic fertilizer,
- Coconut intercropping for multi-storey cropping has potential in the Area. This idea of multi-storey cropping being practiced in other areas in the Philippines may be achieved widely in the Project Area,
- The idea of Sloping Agriculture Land Technology (SALT) could be adopted almost throughout the area to prevent soil erosion and to improve the soils, and
- Planting of abaca and tree crops including fruit trees, abaca and fast growing forest trees are seen as the best possible development strategy in the hilly area.

b) Agricultural and Rural Infrastructure

- Latay creek water can be tapped for small scale irrigation purpose for the Project Area,
- Existing access road (barangay road) which is presently impassable can be improved easily,

c) Agro-Economy

- Despite centering their farm production only on a few crops like rice, white corn and coconut, the farmers at Marangog Area have at the same time been engaged in a number of other crop and livestock production. With sufficient extension services and credit services made available to them, this potential

in the economic production of crops and livestock other than coconut, corn and rice could be made productive in not too long a time,

- The existing barangay administration along with the Bayanihan system will facilitate any process of collective undertakings among the ARBs, be it as input purchase, credit provision, marketing, etc.,
- The high proportion of village population at Marangog Area, having at least elementary school education, is a great potential for them to benefit more fully and readily from any form of social and economic development to be initiated among them. This is not present among the rural people in many other developing countries, and
- The presence of a few families having medium size carabao stock opens a good opportunity for the project to use them as the leaders in the development and expansion of carabao and other livestock production in the Project Area.

d) Animal Husbandry and Fishery

- Through dispersal of female pregnant carabao and establishment of carabao mini-breeding station at the barangay level, the upgraded carabao can be multiplied to have adequate number of carabaos,
- Introduction of mini-incubators (kerosene type) will make the production of adequate number of native chicks for the production of egg and meat,
- In the Project Area, "Cawa river" that have suitable water body can be provided with inland fish. Stocking of fish like carp and tilapia are planned to be carried out by the municipal agricultural office.

e) Agricultural Extension and Organization

- The Project Area has existing organizations that can be re-organized, strengthened, tapped and mobilized to support and implement projects. These organizations have willing members who have been actively assisting the DAR and the Study Team in all phases of the Study period,
- The LGU is supportive of the project and is willing to provide necessary counterpart contributions for manpower, budget, and others,
- There is no NGO working in the Project Area. However, there are NGOs near the municipality and in the province who are willing to collaborate with DAR in the development of the beneficiaries, and
- The beneficiaries have expressed willingness to support the Project by providing free labor if necessary or labor cost lower than the minimum as

counterpart contribution; right-of-way for proposed roads or irrigation canals, provide or volunteer farm area for demonstration purposes, etc.

f) Post-Harvest and Agro-Industry

- Potential of post-harvest and agro-industry is dependent on good quality and volume of materials, that is, agricultural yield, production volume and its quality. As rice and corn will be the major crops in the Area and their productions are expected to be increased, potential of agro-industry and processing for these crops are high. The expected agro-industry and processing are drying facilities, threshing or shelling equipment, milling facilities, warehouse and quality control equipment,
- As the Area and its vicinity have coconut and banana production, there is the potential for coco-charcoal making and banana chip making. However, it is necessary to increase skills of farmers, so the support from the government and concerning agencies will be expected, and
- Abaca seems to have development potentials in the Area, but it can be considered to be in the range of home industry.

g) Environment

- The development opportunities for the improvement of the environment of the landscape of the Area and the public health are watershed approach to soil and water conservation on the sloping contiguous farmlots, rehabilitation of the vegetation cover of the very steep areas by agroforestry systems, rehabilitation of the stream corridors, rehabilitation and protection of the watershed of the spring source of drinking water, establishment of wind break, environment friendly designed road (proper timing of road construction, protection of spoil during road construction, better design of the cutslope and fillslope of the road section, and disposal of runoff water among others), environmental education for the elementary level, production and processing of agricultural products free from chemicals, enhancement of the potential source of irrigation by rehabilitation, protection, and conservation of its watershed, primary health and population education, and production of trees and bamboo for handicraft, house construction, and furniture making.