

**CHAPTER VIII. FEASIBILITY STUDY ON COFCAVILLE
AREA**

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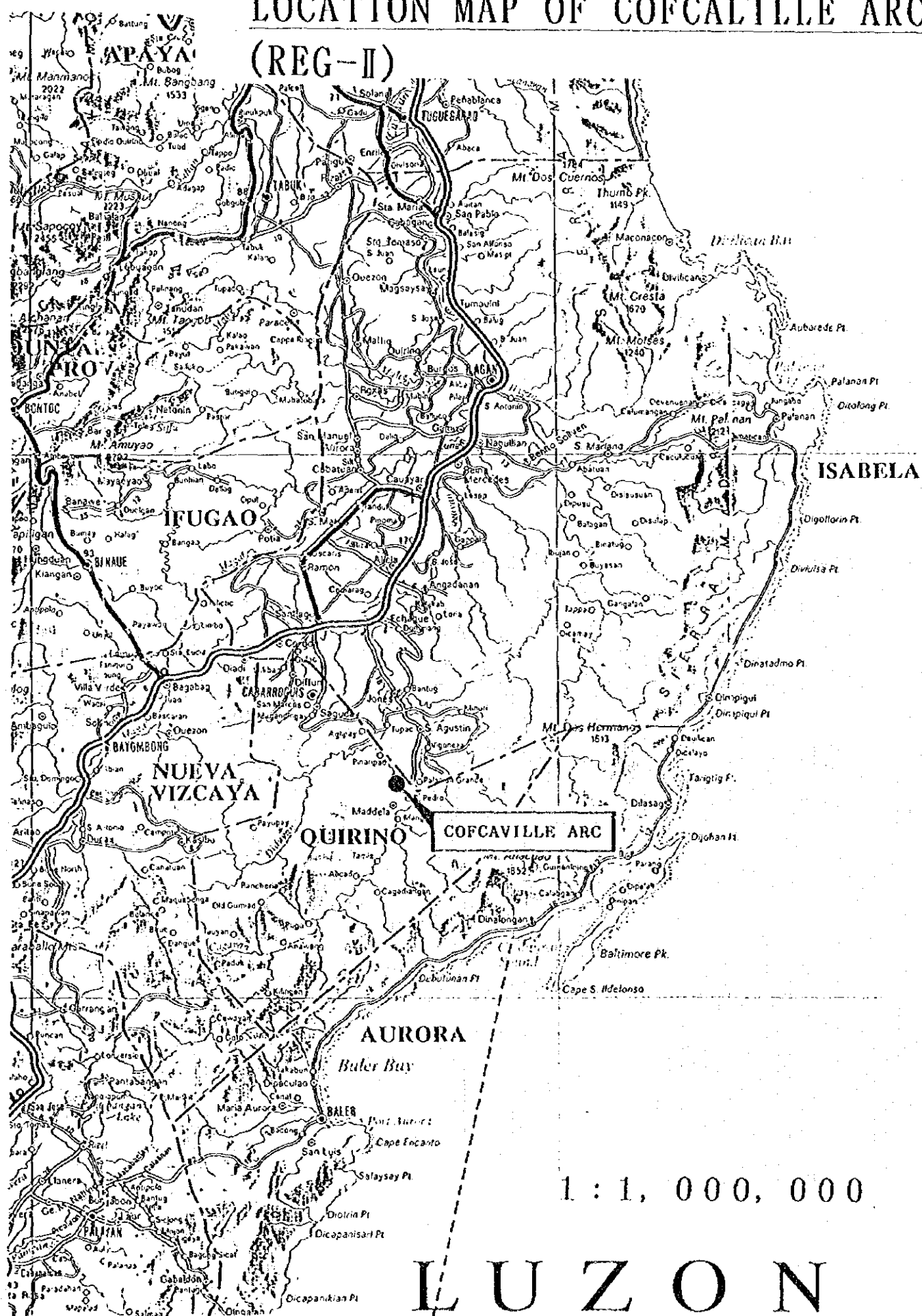
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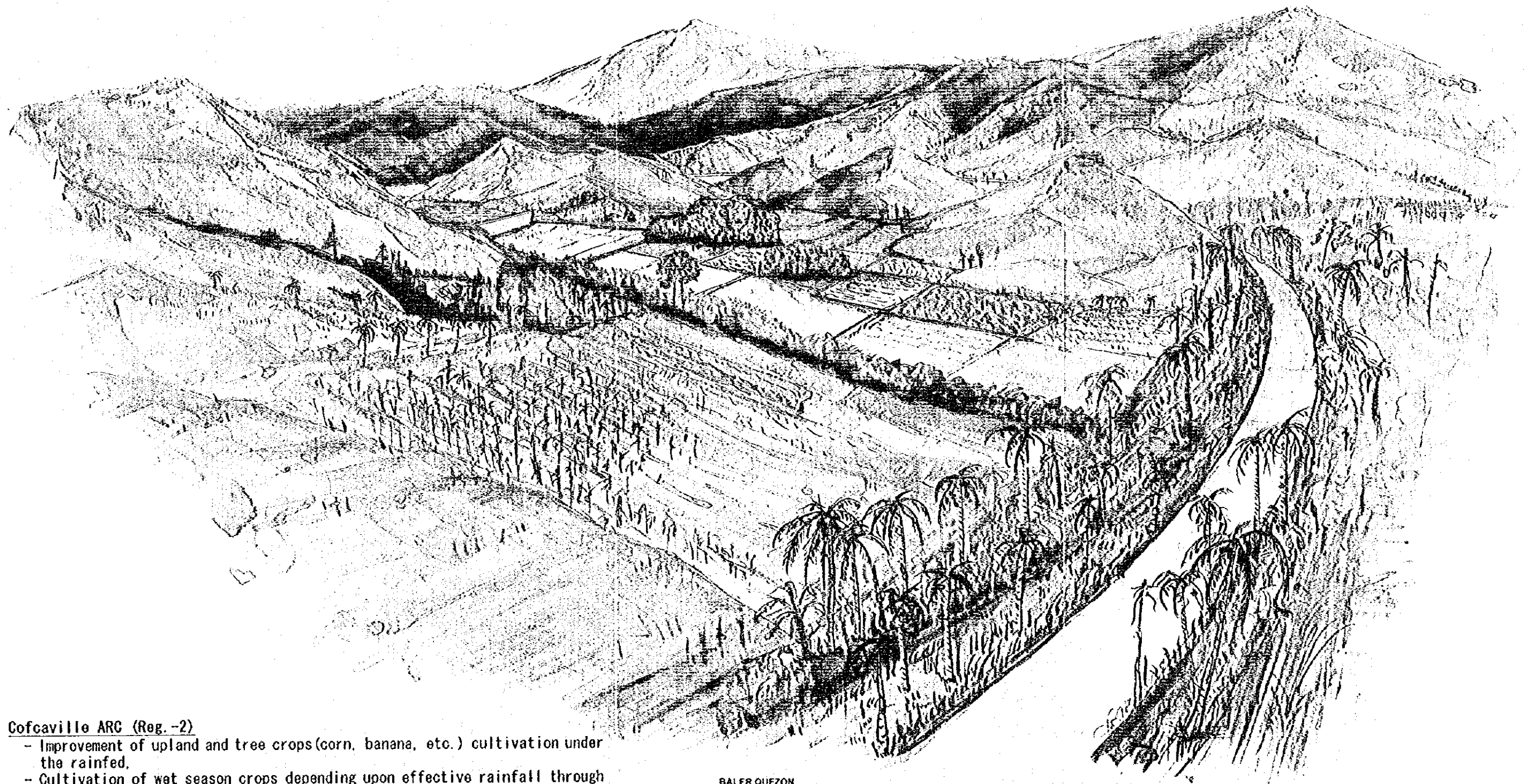
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LOCATION MAP OF COFCALILLE ARC (REG-II)



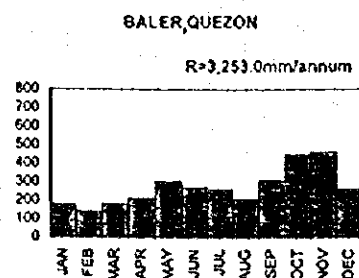
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Cofcaville ARC (Reg.-2)

- Improvement of upland and tree crops (corn, banana, etc.) cultivation under the rainfed.
- Cultivation of wet season crops depending upon effective rainfall through a year.
- Introduction of sloping agriculture under the relative steep slope of land with slightly low ratio of area percentage less than 18 percent.
- Improvement of agriculture and rural infrastructural facilities, especially improvement rural roads.
- 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.



DEVELOPMENT VIEW OF COFCAVILLE ARC

FEASIBILITY STUDY ON COFCAVILLE AREA

8.1 Present Situation of the Area

8.1.1 Comprehensive Agrarian Reform Program(CARP)

1) Progress of CARP

Cofcaville ARC was declared as an Agrarian Reform Community (ARC) in 1994. It has a total land area of about 1,100 ha with an approximate agricultural land of 904 ha. As of June 1996, a total of 329 ha of lands has been distributed to 179 Agrarian Reform Beneficiaries (ARBs) as shown below, which is equivalent to 100 percent accomplishment.

Present Land Distribution under CARP

<u>Manner of Acquisition</u>	<u>Scope (ha)</u>	<u>Accomplishment (%)</u>
Voluntary Land Transfer (VLT)	155.0	100
Voluntary Offer to Sell (VOS)	32.4	100
Compulsory Acquisition (CA)	25.1	100
Government Land/GFI	21.1	100
KKK Lands	95.8	100
Total	329.4	100

2) CARP Organizations and Activities

CARP organizations and their activities are presented in Paragraph 7.1.1 of Chapter 7. Also, their related organizations are presented in Figure B.1-1 to Figure B.1-4.

8.1.2 Physical Conditions

1) Location, Area and Topographic Conditions

The Cofcaville Area belongs administratively to the municipality of Maddela, province of Quirino, and Region-II. The Project Area is eight kilometers away from the town proper of Maddela, and approximately 29 km from the capital town of Cabarroguis.

The access to the Study Area is very hard, especially during wet season. However, with the intervention of the provincial government, a portion of the road

has been graveled and cemented. Under the situation, the Project Area site could be reached by any form of vehicular transportation during dry season. However, during wet season, its poorly gravelled and unmaintained road is impassable.

The total Project Area is 490 ha. Its topography is generally hilly with a sloping terrain from east to west in direction. The elevations in the area vary substantially from about 105 m to 170 m above mean sea level.

2) Meteorological and Hydrological Conditions

The climate condition around the Area is categorized by PAGASA as Type-III. This means that the Area has no pronounced maximum wet season with a short dry season lasting only from one to three months. The areas of this climate type are partially shielded from the south-west monsoon. It is also benefited by the rainfall carried by tropical cyclones. The Area is visited by typhoons 23 times a year on an average. The major features according to the climate data observed at Baler station are summarized as follows:

Major Features of Meteorological and Hydrological Conditions

Month	Rainfall(m m)	Temperature			Relative Humidity	Pan-Evaporation
		Mean (°C)	Max. (°C)	Min. (°C)		
Jan.	178.7	24.4	28.6	20.2	82	130.2
Feb.	141.6	24.8	29.2	20.4	82	117.6
Mar.	182.9	25.8	30.3	21.3	92	155.0
Apr.	213.2	27.1	31.8	22.5	81	129.0
May	306.2	28.2	33.0	23.3	81	124.0
Jun.	272.5	28.4	33.3	23.6	81	120.0
July	263.1	28.2	32.9	23.5	81	96.1
Aug	208.8	28.2	32.8	23.6	79	86.8
Sept.	311.7	27.9	32.5	23.2	81	84.0
Oct.	450.2	27.0	31.5	22.4	82	89.9
Nov.	461.8	26.1	30.3	21.9	83	111.0
Dec.	262.3	25.0	29.1	20.9	83	114.7
Total/Ave.	3,253.0	26.8	31.3	22.2	82.3	1,358.3

Source : PAGASA

Note: Evaporation is derived from La Trinidad (Benguet) station

8.1.3 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 (1).

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 Maddela municipality. It is one of the 30 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 12 offices under the municipality of Maddela. A detailed description of some government offices of the Project Area is presented in Annex I.

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 gleamed by the number of projects or facilities or services provided from the barangay IRA fund and other sources.

For the Cofcaville Area, the projects implemented for the period 1995-1996 were: construction of day-care center, construction of multi-purpose pavement and road and the rehabilitation of the barangay road. The sources of funds for the implemented projects are the IRA fund, CDF, CARP fund and the LGU. For all the projects implemented, no community participation was involved. (refer to Table I.2-6)

2) Population and Farm Household

The total household beneficiaries of the Cofcaville Area are 179. Of this number, about 113 households (or 68%) are beneficiaries of CARP. Many beneficiaries of CARP are transient households, 58 (or 51%) mostly living in the nearby barangays of Maddela like San Bernabe, Poblacion Norte and Lusod. Also, some of the transient beneficiaries are from San Agustin, Isabela, particularly, the barangays of Masaya Sur, Masaya Norte and Centro.

Population and Farm Household

Total Population & Household in the Barangay		Sitio/Purok Covered by the Area	Area Covered	Total Farm HH	ARBs Recipient of Land (No. of Household)		Other ARBs	Total HH ARBs
HH	Pop				Permanent	Transient		
		1. Purok I	P	31	17	14	15	46
		2. Purok II	P	26	16	2	10	28
		3. Purok III	P	26	12	8	22	42
		4. Purok IV	F	26	10	34	19	63
109	806	Total		109	55	58	66	179

F = Full

P = Partial

Based on the socio-economic survey, the average household size of the Area is 4.5 with the fewest and most number of family members reported as one and ten, respectively.

About one-third of the Cofcaville Area belong to the not economically active population (0-14 and above 65 age group). The most number of population belongs to the age range 0-4 (14%). Dependency ratio is 54. Males slightly outnumber the female population with a 1.01 male-female ratio.

3) Land Holding and Land Tenure

The majority of farmers in the Cofcaville Area are new landowners. The average farm size is 2.60 ha. These farmers are recipients of individual CLOAs (126 farmers) and 9 mother CLOAs with beneficiaries numbering 62 farmers. There are 27 farmworkers in Cofcaville Area who are landless. Some of these landless farmers are new immigrants from nearby barangays seeking good fortune in

Cofcaville Area. Some are transients who temporarily live in the Area during the planting and harvest season.

Voluntary Land Transfer (VLT)

There are 19 land holdings distributed through the VLT. Under the scheme, the land price is paid directly to the landowner either in kind or in cash. Payment for the land is two years or more, depending on the agreement. In Cofcaville Area, the price per ha for VLT lands ranges from 5,000 to 8,000 pesos. Only one land holding has not been fully paid by the farmer beneficiaries.

Voluntary Offer to Sell (VOS)

Under the VOS scheme, a privately owned land is voluntarily offered for sale to the occupants. Through the DAR, the farmers are identified, claim folders are documented and surveyed. The Land Bank pays the landowner the amount determined by the Land Valuation Unit of the LBP. The farmer beneficiaries, however, pay the LBP a yearly equal amortization for 30 years.

There are four land holdings covering an area of about 32 ha in Cofcaville Area. The VOS land valuation ranges from 9,000 to 10,000 pesos per ha.

Compulsory Acquisition (CA)

These lands are acquired compulsorily. The landowner is notified about the acquisition of his land. If he does not appear after three notices, the land is acquired. A trust fund is put up in cash by Land Bank based on the land valuation determined by the LBP's Valuation unit. Under this scheme, the farmer beneficiary pays the land for 30 years on an equal yearly amortization.

There are three land holdings identified under the scheme. However, the value of the land has not yet been determined.

Government Lands/GFI

These are lands foreclosed by government financial institutions (GFI) such as, DBP, PNB, etc. The LBP pays the GFI based on the value determined by the Valuation Unit of the LBP. The lands are then transferred to the LBP. The farmer beneficiaries pay the LBP an equal yearly amortization for 30 years. Land price amortization schedule is issued by the Bank.

In Cofcaville Area, the average value of GFI lands ranged from 8,000 to 10,000 pesos per hectare. Though land has been distributed, no schedule has been furnished to the farmer beneficiaries.

KKK Lands

The KKK lands are lands proclaimed under the National Livelihood Support Funds (NLSF) during the time of former President Ferdinand Marcos. These lands are given free to the farmer beneficiaries.

There are 64 beneficiaries of KKK in Cofcaville with a total area of 95.8 ha.

4) Living Conditions

The main source of income of the residents is farming. Main crops grown are palay and corn. Perennial plants grown are banana and mango, which are grown sporadically. Banana which is a major source of income is gathered and sold to traders who visit the Area at least twice a week, when roads are passable. Farmers also sell their banana products to the local trader of Cofcaville, specially when roads became not passable. The nearest market, where agricultural produced are sold in small quantities is in Barangay San Bernardo. Basic commodities like rice, salt, soap, sugar, etc. are also bought in San Bernardo. This barangay is five kilometers away from Cofcaville Area. It is also in San Bernardo that the farmers avail of post harvest facilities like rice mills and threshers.

The main expenditure item for the farmers is food, an average of about 20,800 pesos annually, followed by expenditure on education, medical expenses, clothing and transportation. Though education is a main expenditure item, only about three percent completed college education, ten percent completed secondary education and about 20 percent completed elementary education.

Travel time from the municipality to the Project Area is 30 minutes. Though transportation is accessible during the dry season, transportation facilities are not always available within the Area. It is only during the market day in Maddela (Wednesday and Saturday) that a public transportation is available. Transportation is only one in the morning to Maddela and one in the afternoon to Cofcaville. During ordinary days, the residents travel on foot from the barangay to the highway to reach the town. From the highway, transportation going to Maddela or to Cabarroguis is available.

Electricity is available. However, only very few have electrical connections for lack of money for electrical connections and payment for electrical consumption. The Marginal Area has a multi-purpose center with barangay health center, auditorium, stage and water tank. The surrounding area of the multi-purpose center is paved and is used as drying area for farm products during the dry season. Near the center is the complete elementary school where multi-grade system is practiced for lack of classrooms. The health center is visited by a barangay health worker and midwife, at least once a week. However, basic facilities for medical use and pharmaceuticals are not available in the center. For other health services and needs, the residents avail of the facilities of Maddela and nearby municipalities.

5) Farm Economy and Poverty Conditions

a) Farm Production

At the regional level, palay and corn occupy most land area of Region II. At the provincial level, the priority agricultural commodities are also rice and corn. Other priority crops are banana, peanut, coffee, mungbean and eggplant. The rest includes mango, cassava, camote, coconut, tomato, calamansi, cacao and pineapple.

The average landholding of a Cofcaville family is 2.70 ha. Over one-third of farmers at Cofcaville Area grow wet-season palay of both high-yielding and traditional varieties. More grow it as single crop. The average planted area is 0.22 ha with an average production yield of 2,491 kg/ha. However, only less than half of these (14 percent) grow dry-season palay on an average land area and yield of 0.1 ha and 1,850 kg/ha, respectively. Lack of irrigation water during the dry season has been a major production problem.

Nearly two-third of farmers at Cofcaville Area grow wet-season corn on an average planted area of 0.91 ha. The average yield of corn is 2,512 kg/ha. During dry season, nearly none grow corn.

Other annual crops grown on small area are assorted vegetables during both wet and dry seasons. Banana and mango are the two main fruit trees grown.

b) Farm Household Income

In 1989, the average farm household income in Region-II was 21,436 pesos. Of their total income, farm households earn 66 percent from farm production; seven percent from off-farm employment; 20 percent from non-farm sector and another seven percent from other sources.

In 1996, on the other hand, an average farm household in the Project Area earns total income of 31,337 peso per annum.

c) Farm Production Value

At the regional level, paddy accounts for more than half the total value of farm production. That of corn is eight percent. Livestock including poultry contributes 28 percent while the share of aquaculture production is two percent.

The following are information on farm prices received by farmers in 1996:

Paddy	:	8-9 peso/kg or 50 peso/ganta
White corn	:	4-7 peso/kg
Peanut	:	12-18 peso/kg unshelled

Banana	: 35-50 peso/100 pieces
Mango	: 100-150 peso/sack of 50 kg or 15/kg
Coconut	: 4-5 peso/piece
Gabi	: 5 peso/kg
Cassava	: 100 peso/ganta
Camote	: 4 peso/kg
Gmelina	: 1,000 peso/tree
Carabao	: 6,000/head of young one
Pigs	: 70-75 peso/kg live weight
Chicken	: 50-80 peso/kg live weight

d) Farm Production Costs

The inputs used and other details in the production of various crops are presented as follows:

Palay

- Seed used : 52-54 kg/ha at 15.50 peso/kg or 822 peso/ha
- Fertilizer application : Urea: 2-12 bags of 50 kg/ha at 314 peso/kg
: 14-14-14 : 2-14 bags/ha at 315 peso/bag
: 16-20-0 : 2-14 bags/ha at 315 peso/bag
: Foliage : 0.7-1.5 L/ha at 120 peso/L
- Insecticide : Cymbosh: 1-2 L/ha at 390 L or 390-780 peso/ha
: Others (Karate, Basodin, Nobacrone) : 1 L/ha at 200 peso/L
- Hired labor : Plowing: 2.2-2 mad at 140 peso/mad or 300-3,800 peso/ha compared to 3,000 peso/ha by tractor
: Planting: 2-10 manday(md) at 60-70 peso/md or 1,400 peso/ha.
: Harvesting: 2-20 md at 60-70 peso/md or 140-1,400/ha.
: Weeding: 10 md at 60 peso/md or 600 peso/ha

Corn

- Type of corn grown : Almost all (88%) farmers grow white corn for home consumption.
- Planting hectarage : 0.2-0.25 ha/farm
- Amount of seed used : 18 kg/ha for 1,000-1,200 peso cash or 1,500 peso credit.
- Fertilizer applied : Urea : 1-4 bags of 50 kg/ha
: 14-14-14 : 1.2-12 bags/ha
- Insecticides applied : Cymbush : 0.25-1.0 L/ha
: Others (Decis, Nuvacron): 2L/ha at 530/L.

- Hired labor : Plowing: 3-6 mad at 140 peso/mad plus food.
: Planting: 4 md. at 60 peso/md.
: Harvesting: 2-5 md at 70 peso/md.
: Shelling: 10 peso/cavan.
: Hauling: 40 peso/cavan.

Peanut

- Hired labor : Hauling to market: 35 peso/cart of 1,000 pieces

Carabao

- Stock acquisition : 4,000-7,000 (7 years old).
- Mating services : 500 peso each

Cattle

- Mating services : 500 peso each

Hogs

- Stock acquisition : 500-600 peso/each.
- Feed : Rice bran: 6-8 cavan/6 months
: Corn one cavan/6 months
: Bomax feed supplement 9-10 kg/6 months
: Cassava 15 kg/week

e) Household Farm Workers

Most of family members (89 percent) work on farm. A few others work on other farms (4 percent) and in non-farm activities (seven percent).

f) Household Expenditure

The average household expenditure of a household is 36,637 peso per year. This is the highest among the four Project Areas (22,136 peso at Sappaac Area, 24,848 at Marangog Area, and 34,025 at Silae Area).

6) Conditions of Social Capability

a) Present Condition of Social Capability

An assessment of the barangay community was undertaken to determine the conditions of social capability and preparedness of the community to implement projects. The items 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:

For the period 1995-1996, the barangay council has implemented at least four projects. However, of these four projects, no community involvement and participation is involved. All the projects were either funded from the IRA fund of the barangay, the CDF of the Governor or CARP fund (refer to Table I.2-6).

Maintenance of Barangay Facilities and Resources:

The community facilities and resources of the community are the elementary school, day-care center, artesian well, barangay center, barangay health center and chapel, waiting shed, barangay road and farm-to-market road, etc. The elementary school is maintained by the teachers, pupils and the Parents-Teachers Association. Likewise, the day-care center is maintained by the day-care officer with the assistance of the parents of pupils enrolled in the center. The health center is maintained by the midwife with the assistance of the barangay health worker. The cleaning and maintenance of the barangay center are the responsibility of the barangay officials, the Rural Improvement Club officers and the members of the Sangguniang Kabataan. Cleaning of the entire area is done every first Tuesday of the month.

Though there are five artesian wells in the community, only one is functioning. The community is waiting for the DPWH to repair damaged artesian wells. The maintenance of the one functioning well is taken from the IRA fund of the barangay. The barangay chapel is maintained and cleaned by the regular church-goers whenever masses or other religious activities' area takes place. For the cleaning and clearing of the barangay roads, the barangay community gets together every first Tuesday of the month. However, for levelling and major road maintenance work, the barangay usually request the assistance of the municipal mayor and/or use barangay IRA fund. No maintenance work or activity is being undertaken by the barangay for the farm-to-market roads (refer to Table I.2-7).

Community Participation and Involvement in Organizations:

There are six identified organizations in the community; the Cofcaville Multi-Purpose Cooperative (CMPC), Cofcaville Savings & Credit Association (CSCA), Rural Improvement Club (RIC), Farmers Organization, Roman Catholic Association and the Parents Teachers Association (PTA).

The first three organizations are formal organizations as they have their set of officers, by-laws and/or set of rules and procedures. The last three are non-formal organizations because they were organized for a specific need with very specific functions. The organizations in the area differ in type, composition,

functions and membership. The cooperative (CMPC) is composed mostly of 65 farmers, 53 of which are agrarian reform beneficiaries and 12 non- agrarian reform beneficiaries. The savings and credit association (CSCA) are composed of women and very few men who are either the direct beneficiaries of CARP or the wife/relative of the CARP beneficiary. The RIC is composed of women, mostly mothers of the community.

The farmers' organization is composed of farmers who are not members of the existing cooperative and are residents of the barangay community. These farmers were organized to imbue awareness on the need to be organized and to encourage them join the existing cooperative. The PTA is organized annually by the teachers of the elementary school to provide assistance in the maintenance of school facilities. The organization is not very active since the organization meets only once or twice a year. The membership of this organization is compulsory for all parents of pupils.

Though there are many organizations existing in the Project Area, many members of community belong to one or more organizations. Almost everybody is a member of the church associated organization. The same members belong to the mothers' group (RIC) and the PTA. Many members of the RIC are also members of the CSCA (refer to Table I.2-8).

Traditional Collective Activity in the Community:

There are two traditional collective activities practiced in the community; the "Ammuyo" and the "Bataris or Bayanihan." The "Ammuyo" is a practice of collecting contribution from every household member of the community, for the benefit of the immediate family of a deceased person. When a household member die, the news of death is immediately disseminated to the community. Barangay officials and friends (volunteers) of the dead person collect the amount of ten pesos and one can of rice (equivalent to a little more than one kilogram) from every household. The other members of the community assist the bereaved family in the preparation of the coffin, burial grounds, preparation of area for the wake, preparation of food to be served during the wake, etc. This is one activity where the members of the community participate collectively to assist the bereaved family. For this activity, the members of the community do not hesitate to perform their role in assisting the bereaved family. All activities done are voluntary.

The "Bataris or Bayanihan" is a traditional activity of carrying or transferring house from one area to another. When a house of a member of the community needs to be transferred to another location within the barangay, the community assists in the carrying the house. All together, the men in the community carry the house into their shoulders. Food, such as merienda, is provided by the owner of the house. This collective activity, however, is now seldom practiced in the community (refer to Table I.2-9).

Non-Traditional Collective Activity in the Community:

The community usually gather together on the following occasions: barangay assembly meeting called by the barangay council which is not very regular; 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 the "Araw Ng Barangay" which literary means Day of the Barangay. Since there are many activities like cleaning, decorating, games, dancing, program, etc., the community members work together to make the event successful. Together, they clean, cook, decorate the program area, and serve food to guest, etc.

Community Problem to be Solved within the Community

The barangay officials meet every last Friday of the month to discuss matters related to barangay functions and activities. When need arises as to the necessity of community majority decision, a barangay assembly meeting is called. During the meetings, decisions are made. When disagreements are very evident, the assembly decides by vote and the majority decision is followed.

During the barangay assembly meeting, discussions and announcement on activities of the other organization activities are made. The assembly meeting becomes an opportune time for the other organizations to meet and discuss, as almost everybody is present.

Community Participation in the Development of the Area.

The development plan for the Project Area was formalized through a series of consultations with the leaders and members of the community. The farmer beneficiaries and the DAR development facilitator (DA) identified and prioritized the problems and needs of the community. From the discussions, they were able to identify the proposed projects and activities for the marginal area development. The members of the JICA Study Team had a series of meetings and discussions with the leaders of the community and the organizations to confirm the needs and problems of the community and the projects proposed for development.

During the socio-economic survey conducted in March and April 1996, the farmers were asked to identify their problems and needs and their proposed projects for the development of their community.

When the barangay officials and residents/beneficiaries were asked what manner can they participate in the implementation of development of the marginal area, those in attendance during the discussion indicated willingness to provide free labor for construction and maintenance activities. Some three farmer beneficiaries volunteered to offer their land for farm demonstration area purposes.

Special Skills Available in the Area

The community has human resources with special skill on fishpond and SALT development. There are many small scale fishponds that are the source of fish for the community. Also SALT technology is being practiced in the Area by some three farmers (though two farmers have abandoned temporarily activity for lack of labor and cash). There are ISF recipient farmers in the marginal area and all these farmers have been given training on SALT technology. There are, therefore, many potentials in terms of human skills that can be tapped and developed for the introduction and development of SALT technology in the marginal area.

b) Assessment and Considerations of Present Condition of Social Capability

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 Cofcaville, 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. However, these organizations are not yet fully organized and matured. There are two organizations with members without functions and activities (Farmers Organization and the Roman Catholic Association). The cooperative has very small percentage of members (36%), with a large amount of debt with the LBP (about 460,000 pesos) and with no cooperative activity (due to unavailability of funds). It has an organization with compulsory membership (PTA). Some persons are members of almost all organizations performing almost the same functions and roles.

There is at least six organizations in the project Area. Three of them are very active. 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/activities to be proposed in the Project 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 limited. In the case of Cofcaville Area, all barangay projects are without community participation. Labor and materials are paid by the barangay council from the IRA fund and other sources. There is no opportunity for the community members to involve themselves in barangay project activity. There are organizations (the CMPC, CSCA and RIC) which are very active in undertaking project activities. These associations or organizations can be tapped and developed to assist in the mobilization and implementation of the project activities in the Area.

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 and other possible sources, such the LGU, CDF, etc. for the

implementation of barangay projects/activities; the presence/availability of almost complete barangay facilities/utilities; the assignments of maintenance of facilities/utilities to different groups in the community are signs of resourcefulness in the community leadership.

However, the reliance of the community on DPWH for the repair of their artesian well is a negative factor that needs to be erased. The community must learn to use and maintain their resources and if damaged to find ways and means of rehabilitating these resources.

8.1.4 Agricultural Conditions

1) Soils and Land Use

a) Introduction

The same soil survey conducted in Sappaac ARC was done at a total of 12 representative observation sites during the Phase II field survey. The observation sites are chosen from areas of different land forms and soil types. The soil characteristics of the observation sites based on the survey are presented in Table F.2-2 and Figure F.2-19 and F.2-24.

b) Landform of Area Surveyed

The following three categories of landform are identified;

- (i) Narrow alluvial valleys,**
- (ii) Undulating hills with shallow or no dark A soil horizon,**
- (iii) Undulating hills with moderately deep dark A soil horizon.**

The narrow alluvial valleys have been developed for paddy rice cultivation to some extent, where the original stream channels have been obliterated. The undulating hills with shallow or no dark soil horizon limestone hills are located at the northeast corner and in the central part of the Project Area. The slopes are smooth with no abrupt change in gradient. The southern and southeastern part of the Project Area has undulating hills with moderately deep dark A soil horizon. Except for the occurrence of a relatively thick and soft A horizon, this landform is similar to that of the undulating hills with shallow or no A horizon.

c) Soils of the Area Surveyed

Three soil groups are identified for each of the above mentioned landform categories as shown below.

Soil Group at Cofcaville ARC

Lanform	Soil Group
Narrow alluvial valleys	Inceptisol, Vertic Trophaquepts
Undulating hills with shallow or no dark A horizon	Ultisols, Typic Tropudults
Undulating hills with moderately deep dark A soil horizon	Inceptisol, Typic Tropepts

The soils of Vertic Tropepts are the fine shrinking and swelling clays in the narrow valleys. The soils are generally deep to very deep. The soil texture is clay with very sticky consistency. Paddy rice is the main crop. However, some toe slope (transition zone to the upland area) is planted with banana.

The soil depths of Typic Tropudults are deep, reddish brown to bright reddish brown intensively weathered soils on the undulating uplands. The soils are clay loam to clay with sticky consistency. However, below the 15-20 cm surface soil layer is a stiff and compact clay. The soils are generally strongly acidic with pH ranging from 4.4 to 6.1 as seen in Table F. 2-2. Generally, the subsoil is more acidic than the surface soils. Excessive aluminium content is a possibility for the soils with pH below 5.3. Fertility problems like phosphorous deficiency and fixation are associated with strongly acid soil. Continuous cropping and soil erosion may have resulted in nearly total absence of dark A horizon.

The soils of Typic Tropepts have about 10 to 20 cm topsoil that are brownish black to very dark brown in color. The surface texture ranges from clay loam to heavy clay loam and generally friable. Although the quick soil test kit did not show higher nitrogen content than two other soil types, it could be presumed that the surface soils of the Typic Tropepts has higher organic matter contents. The subsoil is dominantly stiff clay with sticky consistency clay loam texture.

d) Present Land Use

The present land use is indicated in the table below. Four land use categories except for the residential and others are recognized.

Present Land Use

Land Category	Area		Remarks
	(ha)	(%)	
1. Cultivated land			
(1) Rice Land			
- Irrigated	-	-	
- Rainfed	32	6.5	
Sub-total	32	6.5	
(2) Upland	163	33.3	
(3) Orchard	23	4.7	
Total	218	44.5	
2. Grasses and Shrubs Land	237	48.4	
3. Residential and Others	35	7.1	Including roads, and trails and marsh land
Grand total	490	100.0	

Source: JICA Study Team

Rice Land

Paddy rice is grown once a year. Lack of moisture and difficult workability preclude the growing of other crops after paddy rice. In about 40 percent of the Area where water is available even in the dry season, the lands are cultivated with second paddy rice during late wet season to early dry season.

Upland

Corn is the main upland crop in the Area. Grown in lesser extent are upland rice, peanut, and mungbean. Corn is grown twice a year. Low soil fertility and the danger of soil erosion do not allow the wider introduction of upland crops in the Area.

Orchard

Banana is grown at the toeslope of the upland. Banana production is one of main cash income for a considerable number of farmers. Also, mango is grown in the Area. However, the long rainy season becomes a problem especially during the flowering season.

Grass and Shrub Land

This category of land covers about 48 percent of the Project Area. Historically, the Project Area is a logged over area. Logging activities was prevalent in the 1960s. The logged areas are initially covered by grasses.

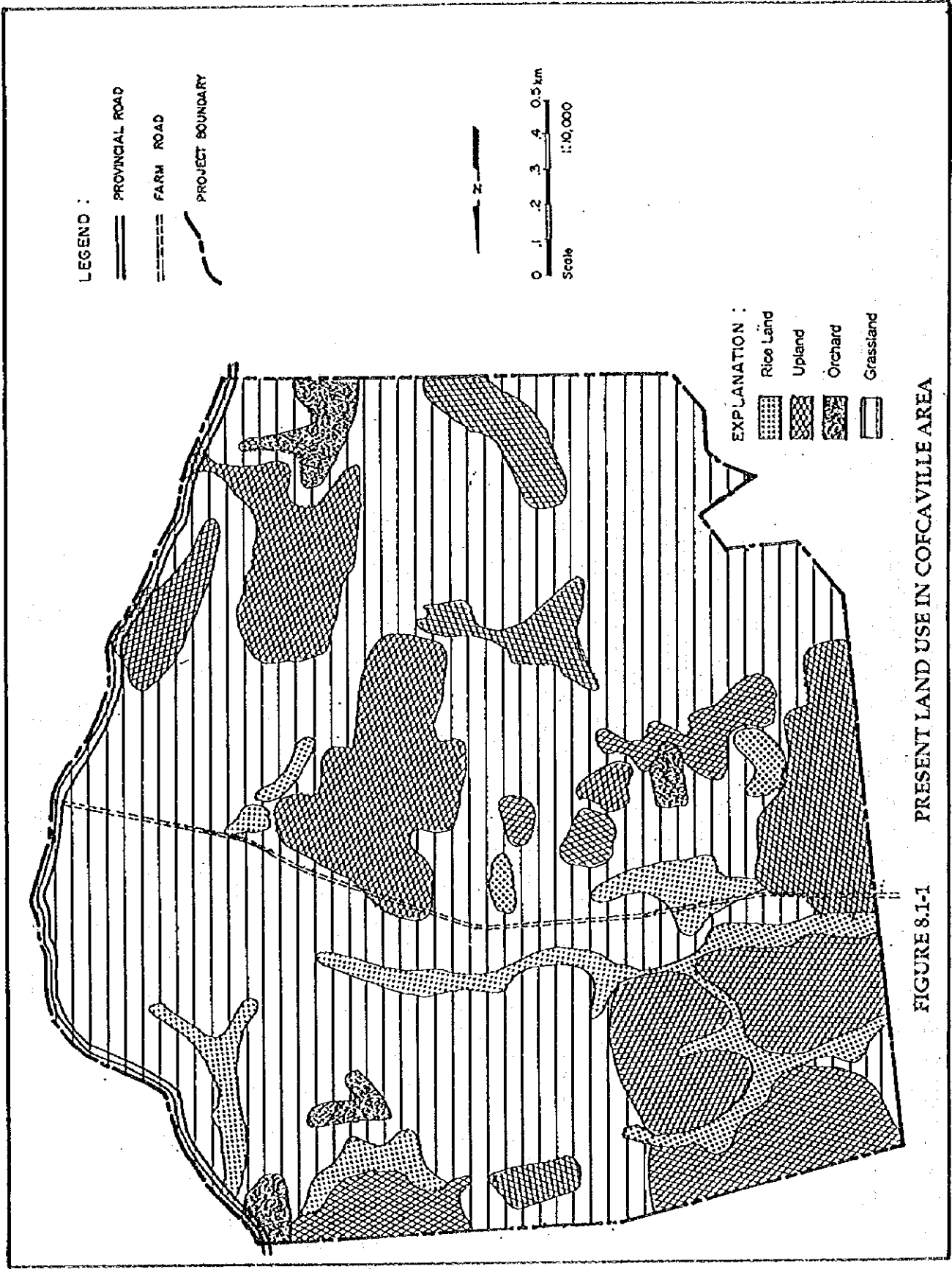


FIGURE 8-1-1 PRESENT LAND USE IN COFCAVILLE AREA

2) Crop Production

The total gross cropped area per year is estimated at 379 ha. as shown in the table below:

Present Crop Production

Land/Crop	Area (ha)	Unit Yield (ton)	Production (ton)
1. Rice Land			
Wet Season			
- Paddy Rice	32	2.5	80
Dry Season			
- Paddy Rice	13	1.8	23
Sub-total	<u>45</u>		<u>103</u>
2. Upland			
Wet Season			
- Corn	155	2.5	338
- Root Crops (Sweet Potato ¹)	8	2	42
- Beans (Mungbean)	8	0.2	2
Dry Season			
- Corn	124	1.9	236
- Beans (Peanut)	16	0.6	10
Sub-total	<u>311</u>		<u>650</u>
3. Orchard			
- Mango	5	0.5	3
- Banana	18	3.1	56
Subtotal	<u>23</u>		<u>59</u>
Total	<u>379</u>		<u>814</u>

Note: The crops in the parenthesis show the respective representative crops.

¹ Including gabi and cassava.

Source: JICA Study Team

The cropping intensity is accounted at 77.3 percent to the total Project Area or 173.4 percent to the total cultivated area as follows:

<u>Cropping Intensity</u>	<u>Intensity(%)</u>
Total Project Area (490 ha=100 %)	77.3
Total Cultivated Area (218 ha=100%)	173.4

Large areas are left as grass and shrubs' land. The reason the large areas are idle may not only be for lack of roads but also soil. About 30 to 40 percent of the idle lands have infertile soils and shallow top soils. Its soil reaction is strong to very strong acid.

The Cofcaville Area falls under type III of the climate in the Philippines, where short dry season lasts only from one to three months. Under this climatic condition, the major crop in Cofcaville Area is yellow corn. It is grown both in wet

and dry seasons. These are the main source of cash income. However, the unit yield of corn per hectare is as low as 2.5 tons for wet season crop and 1.9 tons for dry season. The dense subsoil as well as acidic soils with limited nutrients may have caused the low yield.

Apart from yellow corn, farmers grow paddy rice, beans like peanut and mungbean, root crops like sweet potato, cassava and gabi, and banana. Banana, particularly, cooking banana grows well in the toeslope of the upland. However, the unit yields of these crops are also low.

3) Farming Practices and Input Supply

Most of farmers grow hybrid corn by renewing the seeds for every crop. However, there are some farmers who use their farm produce as seeds for one or two succeeding cropping. The use of these seeds causes the low yield. They employ draft animals for land preparation. However, some farmers prepare the land by employing private tractor services. According to the farmers, the use of tractors is necessary because of the presence of dense subsoil and thickly developed cogon grass roots. Most of farmers apply limited amount of fertilizer and insecticides without using organic fertilizers.

Some farmers plant mango on a relatively large scale. However, the yield of mango is low because of damage of bearing fruits at the flowering stage during the long wet season.

Due to the limited capacity of the local government unit for agricultural extension, the farmers lack technological knowledge on agriculture. There are no demonstration farms in the Area. Also, no nursery exists in the Area, hence seedlings are not readily available. However, some of the seedling requirements have recently been supplied by the PAO and MAO.

4) Animal Husbandry and Inland Fisheries

a) Animal Husbandry

- According to the agro-economic survey conducted by Study Team, 86 percent of farmers have carabaos. The average head of carabao per family is 1.6 heads. Cattle are kept by 20 percent of farmers with an average head of 0.3,
- Most of the farmers in the Project Area keep one to two carabaos. Carabao herds are much bigger than those in other Project Areas. However, reproduction efficiency is still low since no proper breeding work is applied. In the backyard, calves are normally allowed to go with their dams from birth to weaning age of 8 to 12 months depending on the condition and health of the animals,

- Cattle are used in the farm but once the cattle are too old to work, they are sold for slaughter. Feeding is usually haphazard and management poor,
- A few farmers keep goats. However, the browsing habit of goats can be a great disadvantage. When left alone, they kill bushes, young trees and plants by eating off all the young leaves and the young shoots,
- Pig is also common to all farmers. It is owned by most respondents. The more advanced small pig raiser normally has crossbred pigs with exotic boar. However, some growers are able to acquire and raise commercial hybrid stocks. The farmers house the pigs in pens with concrete flooring, fences made of wood and roofing made of nipa or cogon,
- Almost all the farmers own 5-15 native chickens. The average number of chicken breed is 11.2. The availability of hybrid stock is limited at the moment. It is by natural incubation that most of native chicks' breeds are produced in the Area. The native hen, sitting on the usual clutch of some eight to ten eggs, needs little food and even less attention. However, the results are usually rather poor. If the incubating hen was only given a fraction of the care normally bestowed on artificial incubator, major benefits would accrue, and
- There is no reliable supply of liquid milk in the Area. However, raw carabao milk can be bought in the open market or along the roadside in Region-II.

b) Inland Fisheries

- Tilapia culture is grown in the area though small in scale. The species of fish grown are the Nile tilapia (*Oreochromis niloticus*). The common feeds used are rice and corn bran and rice mill sweepings.

5) Marketing of Agricultural Products

Overall, farmers in Region II market about half of their palay production; 65 percent corn; 82 percent coconut; 79 percent banana; 65 percent captured fish; and 95 percent aquaculture fish.

In October 1996, the following marketing situations prevail at Cofcaville Area as compared with the regional level.

Paddy

- While the palay produced by most of the Region-II farmers are sold to the market, most of those at Cofcaville Area are kept for home consumption and seeds for the next crop,

- Majority farmers in Region II sell their palay right after harvest due to limited storage facilities and the urgency of loan repayment. In contrast only a few of paddy farmers in the Project Area do so as most need it for home consumption,
- Most of the farmers sell to the private traders or middleman. Others sell to cooperatives, NFA and rice millers,
- At the regional level most farmers use their cooperatives as the marketing outlet for their palay and suppliers of their inputs. At Cofcaville Area where the cooperative is still at the early stage of operation, there has been no group marketing of paddy through the cooperatives,
- In buying their inputs and selling their palay, the farmers take the prices offered, accessibility and good business or "suki" relations as major decision factors. In general, palay prices in the past were considered too low,
- The NFA's palay procurement is considered untimely and insufficient,
- Several barangay traders are found operating in Region-II and at Cofcaville. Some own sari-sari stores in the barangays. This, besides providing them with additional income, helps establish their "suki" relationship with other villagers, and hence the preference of doing business with certain barangay trader. In several cases, barangay traders serve as buying stations for larger traders and commercial millers in the municipal towns and provincial cities. In so-doing, barangay traders earn a commission ranging from 0.02 to 0.05 peso/kg. The municipal and provincial traders and millers normally come to pick up the palay assembled at the barangay trader. Some traders at the municipality of Madella pay the farmers the transportation costs incurred in bringing their produce to the municipal town.
- While most farmers in Region-II consider low palay prices their only marketing problem, those in Cofcaville Area voiced the following:
 - Poor feeder and farm roads leading to high transportation costs and low farm prices
 - Less availability of transportation
 - Some butcher their pigs and sell its meat to their neighbors and elsewhere
 - Fluctuation in rice price
 - Low crop prices
 - Lack of processing facilities of cassava and banana

6) Research and Extension

a) Research Organizations and Their Activities

The main research organizations located in Region-II are the Cagayan Valley Integrated Agricultural Research Center (CVIARC), Tapaya Research and Outreach Station (Bagabag), Aglipay ROS, Basco ROS (Batanes), Iguig ROS (Cagayan), San Mateo ROS and State College of Agriculture. These organizations are expected to support agricultural development in Cofcaville ARC. Materials dealing with and the activities in these organizations are given in Table H.2-3.

b) Technology Extension Agencies and Their Activities

Regional DA, PAO, MAO, CVIARC, ROSs and ATI have technology extension activities. The technology developed at the research agencies are directly or indirectly transferred from the regional DA and the research agencies to LGUs and farmers through the techno-demo farms and training. The Aglipay ROS has techno-demo farms for corn, upland/lowland rice and peanut.

The MAO's extension workers are front workers of technology extension to farmers. MAO in Madella has 14 staff members. The MAO has one Municipal Agriculturist, two Supervising Agriculturists, one Senior Agriculturist, two Agriculturist-II, two Agriculturist-A, one Agriculturist-B, three Agricultural Technologists, one farm supervisor and one Agricultural Technician. Thirteen out of fourteen staff members are extension workers (front workers) who cover 4,125 farmers in 32 barangays with an average of 317 farmers per extension worker.

Training for the staff members of LGUs and farmers has been carried out by agencies such as, ATI, CV-IARC, ROSs, PAO and MAO at their own training facilities. The Aglipay ROS training facility in Quirino can accommodate about 60 persons at the charge of 30 pesos per day with three meals. It has trained the staff members of PAO and MAO and farmers. The DENR, LBP, CDA and PCC have conducted their training on the fields of environmental preservation, farming funds and carabao breeding, respectively.

c) Seeds/Seedlings Providing Agencies

The PAO, MAO, DENR, CIARC and ROSs provide seeds/seedlings to the farmers. The Aglipay ROS has also provided mango, coffee and calamansi seedlings to farmers.

7) Agricultural Credit

Most of the agrarian reform beneficiaries at Cofcaville ARC (86 percent) have extensively availed of credits from various sources for agricultural production and other purposes. The average size of their borrowings in 1996 is

4,874 peso per household. Additional information about agricultural credit at Cofcaville Area are as follows:

- For crop production loans, the Cofcaville ARBs have borrowed money for the production of corn (68 percent), palay (14 percent), peanut (10 percent) and banana (2 percent).
- The loans for corn are for fertilizers, insecticides, other chemicals and seeds/seedlings. Most of the loans (94 percent) are obtained from merchants with the rest coming from cooperatives. The majority of the loans are less than 5,000 peso each. More than half (63 percent) of the loans are still outstanding.
- The paddy loans are for fertilizers, chemicals, seeds and seedlings. Likewise, the only major sources of paddy loans are the merchants. Most of the loans are less than 5,000 pesos each. Others are less than 10,000 pesos each. More than half (71 percent) is still outstanding.
- The loans for peanut production are for fertilizers and seeds/seedlings. Most are from the informal sources (merchants and relatives) with one-fifth coming from cooperatives. All loans are of less than 5,000 pesos each. Less than half (40 percent) of the loans are still outstanding.
- Other loans in the Cofcaville Area have been availed for livestock production (4 percent), household facilities (12 percent) and education (6 percent).

For credit utilization and credit requirement of the ARBs, the following tables indicate that ARBs at Cofcaville Area experience an average dissaving of 6,295 pesos per household. Either there has been more income from other sources or credits of some sorts have been availed of.

Credit Utilization at Cofcaville and Other Areas

ARCs	Self-Finance (%)	Borrowers (%)		Others (%)	Av. Loan (peso)
		Formal	Non-formal		
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 Requirements at Cofcaville and Other Areas

ARCs	Income			HH-Expense	(unit: pesos)
	Farm	Non-Farm	Total		Save/Dissave
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

8.1.5 Irrigation Water Resources

1) Available Water Resources

Available water resources for irrigation purposes in Cofcaville are small creeks and spring water. A few hectares of paddy fields are presently being irrigated using these available water resources for both wet and dry seasons.

A spring water is mainly observed at the eastern part of the Area with small quantity of discharges. It is used for irrigation and fishpond in recent years.

On the other hand, there exist many small creeks in the Area. However, it is hard to use these creek waters without lifting devices because of low elevation of water sources and hilly and undulating topography.

2) Potential Water Resources

As mentioned above, the spring waters located in the eastern part of the Area are considered to be potential water resources for development. It has stable amount of discharge throughout the year, although their discharges are small. However, to expect effective utilization of these water resources, small-scale impounding dam is recommended to store water.

8.1.6 Agricultural Infrastructure Conditions

1) Irrigation Condition

Most of the existing cultivation areas are under rainfed conditions. Irrigation facilities are not available except for small irrigation ditches at farm level, that were provided by the farmers themselves.

2) Drainage Condition

Due to occurrence of rainfall throughout the year, it is very hard to undertake farming practices under muddy condition. However, severe drainage problems are not observed in the Area because of hilly topography.

3) Farm Land Condition

Most of the cultivation areas except for a small part of low-lying paddy fields are located on hilly and undulated topography. These areas are used for the cultivation of banana, coconuts, peanuts, and upland rice. These farming activities cause severe soil erosion at the sloping areas. However, no effective countermeasures are undertaken for soil conservation.

4) Farm Road Condition

As mentioned above, farm roads are not provided at present except for foot-paths in the field. Hauling, therefore, of input materials and crop products are done manually or pulled by carabao with very simple cart. Under the situation, local people have unfavorable conditions not only for farm activities, but also communication among villages in and around the area.

8.1.7 Rural and Social Infrastructure Conditions

1) Rural Roads

The access roads to Cofcaville Area are one provincial road and two barangay roads. This provincial road, five kilometers in length branches off at barangay Villa Hermosa near the municipality Maddela. The road is unpaved. Recently, the provincial DPWH placed gravel and boulder on the roads for protection of muddy surface. Furthermore, steep slope portions with total length of about 300 m were paved with concrete.

Under the condition, public transportation by jeepney from Cabarroguis to Cofcaville was started at a frequency of three times a week.

Besides the above provincial road, the Local Government constructed two barangay roads in 1995. One road is located at the center portion branching off the provincial road. The other road is located at the western boundary of the Area. However, these barangay roads are usually muddy that does not allow the passing of vehicles.

2) Rural Water Supply

The Area has one deep well and 28 shallow wells equipped with hand pumps (level-I water supply system) at the lower areas along existing creeks near the provincial road. Total number of beneficiaries is 83 household.

3) Rural Electrification

The houses along the provincial roads are electrified. However, only less than ten percent of houses have electricity, due to high initial costs.

4) Other Rural and Social Facilities

The facilities available in Cofcaville Area are complete elementary school, day-care service center; barangay health center, chapel and barangay center with stage, auditorium, multi-purpose pavement, water tank, and waiting shed. The social facilities and services are mostly concentrated in one cluster at the center of barangay proper.

The barangay has a complete elementary school located at the center of the barangay. The school has also a new building with two rooms used as school office and H.E. room. The other building is old and dilapidated with four rooms. The school classrooms need repair or replacement. High school and college education are availed at Maddela and Cabarroguis in Quirino, or at Santiago City in Isabela.

The health center has very minimal facilities, only one chair, table and bed. There is no other medical equipment and supplies except the stethoscope and the damaged weighing scale. Medicines are not readily available. A midwife is available in the Project Area. However, the midwife is also serving three other satellite barangays. The services provided by the health center 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 municipality.

The barangay day-care center is newly constructed. Classes started last June 1996. However, the center needs water system, toilet and fence.

8.1.8 Farmers' Organization and Their Activities

1) Farmers' Cooperatives

a) Cofcaville Multi-Purpose Cooperatives Inc.

There is a farmers' cooperative named "Cofcaville Multi-Purpose Cooperative Inc." in the Area. It was established in 1991. The number of members is 53 or 50 percent of the total farm households (106 households) in the barangay. Of these, 38 members or 50 percent of the total farm households (76 households) are ARBs. At present, the cooperative has acquired a big loan for crop production from LBP. The loan has not yet been repaid due to severe calamities (drought and typhoon) for the last three years. Due to such situation, another farmers' organization was organized in 1994. The group attend regularly the barangay assembly where problems and needs are discussed. The members also actively participate in the planning of the development of the Project Area, specially related to the JICA-assisted project.

Activities of the Cooperative

Due to non-payment of big debt, the cooperative's activity is focused on debt collection. The cooperative activity is also concentrated on the collection of capital share and forced saving. This is because at present, only six of the cooperative members have paid the capital share of 500 pesos. Many of the members have paid only a part of their capital share.

Information for the Development of Cooperative Activities

Purchase of production materials is done individually by each farmer from traders. Payment is done by goods (90 percent of the farmer) or by cash (10 percent) after harvest (80 percent) with 10 percent interest per month. Sale of agricultural products is done individually at the market (50 percent of the farmers) or at farm gate (50 percent). Many farmers sold products at farm gate and feel that the price received is unreasonable. About 50 percent of the farmers produce seeds and seedlings by themselves. The others buy individually.

Production technology is introduced by the MAO extension worker who visit the Area once in six months, MARO, development facilitator (twice a week), other agencies (DSWD, DOH) and through farmers' training. Training so far received are leadership training (one day), simple bookkeeping and accounting, farmers' class integrated training (one day) by DA and SALT training by DENR. Support services strongly required for their farming activities are barangay road and access road to market followed by post harvest facilities (solar dryer), financing, farming technology and carabao dispersal.

2) Other Community Associations/Organizations

Besides the multi-purpose cooperative, there are five other identified organizations in the Area as shown in Table I.2-8. The Farmer's Organization and the Roman Catholic Association are informal organizations catering to specific needs and functions. The other three organizations are the savings and credit group composed mostly of women, the women's group (RIC) and the PTA, the concern of which is school-related activities.

Except for the PTA and the Roman Catholic Association, all the existing organizations are very active in their affairs and in community programs and affairs. However, these organizations still lack the necessary capability to expand and improve their resources. These organizations can be developed, tapped and can be an important basis for mobilization and support in community activity of the Project.

3) Women in Development

Women participation in the community activities and organizations are substantial. Women participation in the barangay community in terms of organization participation are as follows; one woman barangay council member (or kagawad), a women's organization composed of 70 members, a credit association composed mainly of women (29 out of 32) and women officers of the cooperative (nine out of 65 members).

Women's activities are concentrated on household work, family care, child rearing and assistance in farming activities and involvement in organizations' community affairs. Women in the community, specifically, the members of the RIC had training on papaya pickling, tomato sauce making, banana chips making, dressmaking and tailoring. However, these skills has not been put into use due to lack of capital and market. The Area has potential skills acquired which can be tapped in the future. There are other livelihood activities being taken cared of by women in the Area, such as, piggery project by the RIC, the banana production and trading supported by the Cofcaville Savings and Credit Association.

The needs identified in the Area are more livelihood projects for women.

4) Non-Government Organizations

The NGO involved in the Area is focused on the provision of credit to farmers. The maximum amount of credit provided is 6,000 pesos per farmer with an interest rate of 12 percent per annum on a six-month term.

There are two 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.2-10 on the profile, programs and services, and plans and programs of the NGOs within the Project Area.

8.1.9 Post-Harvest and Rural-Agro Industry

1) Post-Harvest and Rural-Agro-Industry Conditions

In Cofcaville Area, rice is planted in an area of 45 ha, corn in 279 ha, legume in 24 ha, root crops in eight ha. Banana and mango as fruit crops are planted to an area of 18 and five hectares, respectively (refer to Table K.2-6). Almost all farm works are performed manually. Specifically, manual harvesting is popular. Some private farmers use corn sheller with engine and multi-purpose dryer (pavement). Some crops are dried in the harvested field and in public multi-purpose dryer.

However, drying facilities are not enough as compared with the production volume. As plenty of work force for planting and harvesting works are necessary, some farm families hire labor, mostly their relatives or neighbors for reducing said long and heavy works (refer to Table K.2-1).

Corn is the major crop at present in the Project Area. Its yield and production are 1.9-2.5 ton/ha and 623 ton/year, respectively. Rice is also a major crop and its yield and productions are 1.8-2.5 and 103.4 ton/year, respectively. Therefore, privately owned corn sheller and public multi-purpose dryer are available in the Area. As the yield and production of other crops are low, no agro-industry and processing facilities nor agricultural machinery is found.

As the market for produced are far from the Area, crops are sold to the traders, usually to the local traders in and around the Area without any processing. Municipal poblacion and provincial capital have some marketing places, but the distance between the Area and municipal poblacion or provincial capital is seven km and 35 km, respectively. The roads are rough and undulating, so it is 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 approximately one third of persons have the willingness for agro-industry and processing activities compared with the few numbers of persons who have the skills (refer to Table K.2-4).

Fish culture and mushroom productions are the most favored farming and agro-industry. However, only very few persons have the necessary skills.

Near the Project Area, 14 private rice mill plants and one handicraft cottage industry are found. However, no special agro-processing facilities are found. However, as the Area is near Cagayan Valley that is one of the most suitable area for rice and corn production, manufacturers and distributors of agricultural machinery are available.

8.1.10 Rural Environment and Public Health

1) Soil Erosion

Typic Tropepts and Typic Tropudults, the extensive soils, are moderately eroded but have shallow surface soil. The undulating hills on the northwestern and central portions of the Project Area have shallow or no surface horizon. This indicates that soil erosion has occurred over a longer period even before logging was in full operation. The site is a logged-over area.

Farmers still practice up and down the slope cultivation. Grassland fire during summer destroys the litters that protect the soil from high rainfall erosivity

till the grasses cover the soil surface completely (Table P.2-1). About 48 percent of the area is covered with cogon, talahib, and shrubs. About 70 percent of the Area is rolling to steep hill. With typhoon hazard, high rainfall erosivity, and extensive planting of annual row crops, soil erosion is a serious environmental concern. About 50 percent of the farmer respondents reported that soil erosion together with landslide affected their farmlots in the last five years (Table P.2-2).

Table P.2-3 shows the estimated soil loss on different parts of the marginal area. The farmlots planted with upland crops have estimated soil loss of about 25-165 tons/year. The grassland has about 9-156 tons/year. Madella Municipal Planning Office (1995) reported that the estimated soil erosion in the area with 8-30 percent slopes is about 2-10 cm/year or 200 - 1,000 tons/year.

According to a key informant, most of the beneficiaries attended the Integrated Social Forestry training on soil conservation using the A-frame for establishing the contour lines for planting the hedge rows. However, they have not practice this on their farm land except one farmer.

2) Water Quality

Artesian wells, springs and the motor driven deep well at the Barangay Health Station are the sources of drinking water of the community. Waters coming from these sources are not treated and may not be safe for drinking. The latter is used mainly for the service of the Barangay Health Center. The cemented storage tank is not adequate for the requirements of the Center. About 12 percent of the respondents reported problem on water pollution (Table P.2-4). Field test for the Coliform of the different artesian wells on October 23, 1996, showed that two artesian wells at the Barangay Proper had very high Coliform counts (Table P.2-18). This indicates that the water from these two artesian wells must be boiled before drinking to prevent the occurrence of water borne disease. One of these is too shallow. The pupils in the Cofcaville Elementary School should be careful in using the water from the artesian well for drinking.

About 20 percent of the farm households do not have toilets (Table P.2-4). This could contribute to the potential pollution of the sources of the drinking water. This is the leading environmental sanitation problems together with the lack of potable water supply in the community.

3) Flora and Fauna

The secondary forest area is limited. The forest species available are mahogany (*Swietenia macrophylla*), narra (*Pterocarpus indicus*), gmelina (*Gmelina arborea*), ipil-ipil (*Leucaena leucocephala*), kakawate (*Gliricidia sepium*), dapdap (*Erythrina species*), bamboo (*Bambusa blumea*), and manzanita (*Muntingia calabura*). One of the farmer beneficiary is planting gmelina in his farmlots for furniture making. Farmers prefer narra, mahogany and gmelina for agroforestry. Some of them are willing to learn the techniques in bamboo pole and

shoot, and wood charcoal and fuelwood production (Tables P.2-6 and P.2-7). Only few of the farmer respondents have the required skills in these agroforestry livelihood systems.

The orchard is only about five percent of the Project Area. Fruit and industrial crops planted are coffee, cacao, mango, passion fruit, guyabano, banana, coconut, caimito, jackfruit, lanzones, chisa, guava, chico, pomelo, pineapple, papaya, santol, and achuete. Banana is the number one crop of the community. In the nearby Integrated Social Forestry area, wild rambutan is present that could be used as the stock for introduction of maharlika variety of rambutan. Table P.2-8 shows the variety of crops grown in the marginal area.

About 48 percent of the area is covered with cogon (*Imperata cylindrica*), talahib (*Saccharum spontaneum*), and hagonoy (*Chromolaena odorata*). The talahib is overgrown that farmers have difficulty clearing their famlots. Frequent occurrences of brushfire during summer destroy the crops of the farmers.

Table P.2-9 shows the animals raised by the community. There is no wild life in the Project Area. Tilapia is raised by the farmers in about ten small water impounding ponds. About 76 percent of the farmer respondents would like to learn fresh water culture but 18 percent have adequate skill on tilapia culture.

4) Public Health

The malnutrition problem of the children below seven years old is moderate. Only six children with third degree malnutrition were reported in 1995 (Table P.2-10). However, 13 pre-schoolers with second and third degree malnutrition were recipient of the supplemental feeding program in 1995. The Department of Social Work and Development provides very limited food assistance for the malnourished children, twice every quarter that consists of packets of Milo and Nido, and few pockets of instant noodle. Lean month is in July-August.

Immunization program of the children is a continuous program of the Municipal Health Unit. In 1995, about 15 children received complete immunization including Hepatitis vaccine (Table P.2-11). This is only about three fourths of the average number of new born babies per year. In 1996, about ten children have incomplete immunization. In spite of immunization against measles, this disease is one of the causes of morbidity among children (Table P.2-12). In addition, viral infection and respiratory diseases are the other common diseases of children. The same diseases cause the morbidity for other members of the community but malaria is added (Table P.2-13). The annual expenses for medical services are about seven percent of the family income (Table P.2-14). Measles, diarrhea, and bronchitis are the leading causes of mortality among children (Table P.2-15). This suggests that not all children in the community avail of the immunization against measles. The use of pills is the most preferred family planning method (Table P.2-15).

Cofcaville Barangay Health Station serves several barangays near Cofcaville ARC: St. Tomas, Villa Ylanan, San Salvador, Divisoria Sur and Divisoria Norte. The midwife assigned in the ARC is not available on a regular basis. The activities at the health center are done on a weekly basis. The Center does not have adequate clinical facilities, basic medical equipment like sphygmometer or for first aid or paramedic treatment and cold storage for vaccine for the service barangays. The drinking water storage tank is too small for the center and needs rehabilitation. There is no adequate supply of medicine. The Center needs communication equipment to be able to consult with the Municipal Medical Doctor or with the Provincial Hospital in Cabaroguis in case of emergency.

8.1.11 Present Problems, Constraints, and Development Potentials

1) Present Problems and Constraints

a) Agriculture

- The average farm size is relatively large, at 2.73 ha per farm household, including 1.23 ha of idle/uncultivated land. The net cultivated area is 1.22 ha,
- The cropping intensity to the total land is 77.3 percent or 173.4 percent to the total cultivated land,
- The nitrogen and phosphorus deficiencies are severe in the upland. The application of nitrogen and phosphorous together with organic matters will be essential. Also, the strong to very strong acid soils need liming. Moreover, there is a problem of dense subsoil that may disturb root development. The lack of capital to buy adequate nitrogen and phosphate fertilizer and limited supplies of materials for organic fertilizer are major problems to increase crop production in the upland, and
- About 48 percent of the Project Area is left as idle/uncultivated land, which is mostly covered by cogon. It is difficult to open the soils by using draft animals in these areas. Moreover, soil erosion is the most pressing problems in the idle/uncultivated land with slope more than 18 percent.

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, and
- Health services are mostly availed in the poblacion and in the nearby barangays. Medical equipment and facilities and medicines are inadequate. The most pressing problem for the medical personnel, specially the

midwives, is bad accessibility to the area. On the other hand, for the beneficiaries, inaccessibility to the health services due to the absence of regular transportation facilities.

c) Agro-Economics

- Depending on only a few crops as their major source of income, farm families in the Project Area are greatly susceptible to loss in income due to 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 Cofcaville Area. Improved farm and feeder roads will not only facilitate and increase production but also help boost marketing of agricultural production,
- All the unsolved hardships in the past in the production and living conditions of the people of the Cofcaville Area have left them with fewer resources to invest enough in their agricultural production. All sorts of development being planned for the Project would fail to reach the project objectives unless sufficient credits are also made available to them to supplement their small capital,
- The newly established cooperative at Cofcaville Area is still not actively functioning. They need to be strengthened to assume the role of credit and marketing facilitators for all economic activities in the Area.
- The potential of Cofcaville 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

- Although adult carabao weight is better to those in other Project Areas, its reproduction efficiency is rather low without applying proper breeding practices,
- Most of chicks are produced in the Area without applying artificial incubation. The hatching rate is poor, and
- Some tilapia culture has been undertaken privately on small scale basis in the area due to limited water.

e) Farmers Organization and Agricultural Extension

- The existing organization, specifically the cooperative, is weak, having very limited membership and business activities, and with large amount of uncollected debts from Land Bank of the Philippines. The cooperative members and officers lack the necessary training, capital and skills to manage a business enterprise, 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 the roads are rough and inconvenient. Therefore, agricultural products can not be sold at proper prices,
- Appropriate training and support can not be obtained from government agencies concerned,
- Farmers have low income and low budget for investment. Loans from the banks require much paper work. High bank interest and mortgage requirement prevent the farmers from obtaining loan,
- Farmer's intention for cooperative is very low. The number of cooperative members is not enough, so it is difficult to manage and operate the cooperative,
- High cost input and low input application result to low productivity, so low production volume lessens 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 about quality control, and
- There is high selling price fluctuation between harvesting and off season. Prices during harvesting season are quite low.

g) Environment and Rural Life

The environmental problems and constraints to sustainable development of the Cofcaville Area are: (i) extensive cogon and talahib vegetation in the farmlots of the ARBs which makes land clearing difficult, (ii) grassland fire, (iii) inadequate forest cover of the watershed of the Project Area, (iv) soil acidity and low fertility (v) soil erosion, (vi) typhoon hazard, (vii) pollution of the sources of drinking water, (viii) occurrence of water borne diseases, (ix) malnutrition of children, (x)

occurrence of lean months, (xi) inadequacy of toilet in the farm households, and (xii) inadequacy of facilities and basic equipment in the Barangay Health Station and lack of medicines.

2) Development Potentials

a) Agriculture

- Topography of the Area that is undulating favors the development of small water impounding structure for irrigation purpose. Irrigation will contribute to increase staple food production like rice and mungbean. As some farmers raise tilapia in some fish ponds located in the narrow valleys, the impounding water could be used to raise inland fish,
- The application of nitrogen and phosphorous together with organic matters will be effective for higher productivity of upland crops. Obviously, there should be a soil fertility management program to correct the strongly acid condition of the soils. Liming can be done to correct soil acidity. Also, planting of green manure crops, hedgerows and trees can provide the opportunity to supply substantial amount of materials for organic fertilizer,
- In the upland including the idle/uncultivated land, sub-soiling with the use of machinery may improve tilling and root development. Such machinery should only loosen the subsoil without mixing the subsoil with the more fertile top soils. The dense root in the grassland will be treated easily by applying machinery, and
- The transition zone between the valley and the upland where moisture is very favorable due to seepage could be used for expansion of banana plantation. A row of banana can be efficient trap for soil erosion from upland. In the above area with more than 18 percent slope, hedgerows should be planted as a deterrent for soil erosion. Shrub or pasture grasses may be used for hedgerows.

b) Agricultural and Rural Infrastructures

- Existing fish pond can be developed into small water impounding dam to expand water utilization for irrigation purpose, and
- Existing barangay road across the Area can be improved/upgraded to support and encourage agricultural activities.

c) Agro-Economics

- Despite centering their farm production on only a few crops, the farmers at Cofcaville Area have at the same time been engaged in a number of other crop and livestock production. With sufficient extension and credit services

made available to them, these hidden potential in the economic production of more varieties of crops and livestock could be made possible in the future,

- The existing barangay officials along with the Bayanihan system will facilitate any process of collective undertakings among the ARBs, whether as input purchase, credit provision, marketing, etc., and
- The high proportion of village population at Cofcaville Area is a great potential 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.

d) Animal Husbandry and Fishery

- By carabao dispersal of female pregnant carabao and introduction of carabao mini-breeding station at the barangay level, upgraded carabaos can be propagated not only to supply adequate number of draft animals and but also to produce carabao milk, and
- Introduction of mini-incubators (kerosene type) will be effective to produce adequate number of chicks for production of eggs and meat.

e) Agricultural Extension and Organization

- The Project Area has existing organizations that can be re-organized and strengthened and which can be tapped and mobilized to support and implement projects. These organizations have willing members who have been actively assisting the DAR and Study Team during all phases of the study,
- The LGU is supportive of the project and is willing to provide necessary counterpart contributions for manpower, budget, and others,
- There are two NGOs working in the Project Area, and there are one NGO within the municipality and the province who is willing to collaborate with DAR in the development of the beneficiaries,
- The beneficiaries in the Area 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, irrigation canals or provides farm area for demonstration purposes, etc, and
- The Project Area has an active women's organization involved in simple income generating activities. This woman's organizations can be strengthened and tapped to assist in the development of the Area during the implementation stage.

f) Post-Harvest and Agro-Industry

- Potential of post-harvest and agro-industry is dependent on good quality and volume of materials, i.e., 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, potentials for these crops are high. The expected post-harvest and agro-industry equipment and facilities are drying facilities, threshing or shelling equipment, milling facilities, warehouse and quality control equipment, and
- As the Area and its vicinity have enough banana production, there is the potential for banana chip making for cottage industry. However, it is necessary for farmers to learn the technology. Hence, support from government concerned agencies will be expected.

g) Environment

- Soil conservation-based farming systems using the watershed approach including the rehabilitation of the forest cover on the very steep slopes and of the stream corridors,
- Establishment of windbreak to protect the crops from strong wind damage, planting of forest trees for furniture making, diversified planting of vegetables and fruits to improve the nutrition and increase resistance to different diseases,
- Informal primary health and population education, planting of herbal medicine in the home garden, fish production in the water impounding structures, and
- Confinement of domesticated animal to enhance animal waste, recycling for bio-fertilizer production, aggressive marketing of the processed native farm products as incentive for resource conservation, and upgrading the facilities, equipment, and medicine supply of the Barangay Health Station.

8.2 Development Plan

8.2.1 Objectives and Components of the Project

1) Objectives of the Project

The short-term and medium/long-term objectives for the development of marginal area are described below:

Short-Term Objectives

- To settle the farmer beneficiaries in the Area with sustainable assistance and support,
- To preserve the environment conditions of the Area by determining proper land-use and preventing soil erosion,
- To generate productive lands by providing small-scale irrigation and drainage facilities, and farm-to-market roads,
- To strengthen productive activities by developing agricultural support and institution, such as, the provision of necessary post-harvest facilities, training, extension services, cooperative organization, peoples' social capability building, etc., and
- To improve the environmental and health conditions of the Areas by providing rural water supply, electricity supply for non-energized areas, access road improvement, school building construction and expansion, primary health care services' improvement and multi-purpose center provision.

Medium/Long-Term Objectives

- To alleviate poverty and improve welfare conditions of ARBs by giving them opportunities to increase their income by improving and/or providing the necessary agricultural infrastructures and services, and
- To increase the annual income of the households to the target level year of 2000 in the Medium-Term Philippine Development Plan (MTPDP).

2) Components of the Project

The project components of the Cofcaville Area are as follows:

- Construction and improvement of access roads,
 - Improvement of provincial and barangay roads located in the Project Area.
- Formulation of agricultural development plan, such as, land-use, crop selection, sloping agriculture under scarce water source conditions, and development of animal husbandry
 - Provision of nursery and training and on-farm development farm,
 - Livestock (carabao) dispersal, provision of animal breeding center and poultry incubator.
- Development of agricultural and rural infrastructures,
 - Development of small-scale irrigation systems by means of impounding dam, drainage systems and farm roads.
 - Development of rural roads, social infrastructures such as school, paramedical supplies, etc.,
- Development of post-harvest and agro-industry facilities,
 - Provision of agricultural machinery, post-harvest and agro-industry facilities
- Establishment/strengthening of farmers' organization and promotion of agricultural supporting services,
 - Establishment and strengthening of farmers' organization,
 - Promotion of agricultural supporting services,
- Environmental considerations,
 - Establishment of soil conservation, protection of agroforestry, rehabilitation and protection of watershed, and establishment of wind break,
 - Environmental monitoring and evaluation
- Social capability development and institutional strengthening.
 - Undertaking of barangay, local government units (LGUs) and other local agency consultation,
 - Formation of local technical working groups(LTWG),
 - Social preparation of the communities
 - Strengthening of DAR and other local agencies