# PART-I : PHASE-I STUDY (FORMULATION OF BASIC DEVELOPMENT PLAN)

# CHAPTER I. INTRODUCTION

# CHAPTER 1. INTRODUCTION

## 1.1 Background of the Study

The agriculture, forestry and fisheries in the Republic of the Philippines occupy about 22 percent of GDP in 1992 and 45 percent of working population in 1990-1992, and is one of the main industry in the country. There is, however, a large income disparity between the rural and urban areas owing to low agricultural productivity and immaturity of agriculture with value added. As a result, rural development with agricultural and rural infrastructure arrangements is regarded as important component of the agricultural sector in the Medium-Term Development Plan (1993-1998).

The important concern of the Comprehensive Agrarian Reform Program (CARP) is the alleviation of poverty and raising of the rural living standard by means of distributing farm lands to poor farmers and rural workers without lands, which is about 25 million persons corresponding to about less than 50 percent of the 60 million population. Of these lands, about 3.7 million hectares of lands have already been distributed as of 1995.

Most of the lands to be distributed classified as suitable lands for agriculture owned by the Government and the private sectors/persons. With slope of less than 18 degrees,the land is situated far away from the main communities without stable water sources such as creeks, spring and groundwater, and hilly areas which are undulating, but yet reclaimed and developed. In addition, since the support services for infrastructure arrangement from DAR (Department of Agrarian Reform) are quite limited for lack of budget, personnel, etc., it can not be said that the initial purpose of the Program has been fully achieved, in spite of the wide distribution of lands.

The Government of Japan expressed cooperation in the implementation of CARP, by dispatching the economic cooperation integrated Study Team in June 1988. Henceforth, JICA (Japan International Cooperation Agency) has carried out the Feasibility Study on Integrated Jala-Jala Rural Development Project, Feasibility Study on Southern Palawan Viable ARC Development Project, etc. Hereafter, setting up of small-scale agriculture and rural development plan at low cost and widely usable for various purposes, like simple infrastructure arrangement, is desired for attaining agricultural land distribution, improvement of farmers' settlement, raising of productivity, etc. within limited time and budget.

In view of such circumstances, the Government of the Republic of the Philippines requested the feasibility study for establishing this development plan to the Government of Japan in August, 1994.

## 1.2 Objectives and Scope of the Study

### 1.2.1 Objectives of the Study

The objectives of the study are as follows;

- To support CARP established in 1987, Model Areas will be selected from Agrarian Reform Communities (ARCs) under marginal and hilly conditions with no stable water sources from 12 Regions, and a Feasibility Study that set up the development plan will be carried out for the purpose of poverty alleviation and improvement of farmers' living condition through improvement of farmers' settlement and increase in their agro-productivity by developing easy and simple methods to be replicated in other areas at low costs. The Guidelines for development direction for the other ARCs will be prepared.

- In the course of the Study, technology transfer and guideline on studying methods regarding respective study items, and procedures and ideas for making plans will be transferred to the Philippine Government counterpart staff.

### 1.2.2 Scope of the Study

The Study would be implemented in the following two phases;

Phase-I Study (Formulation of Basic Development Plan

- Home office work
- Phase-I field survey
- Phase-I home office work

Phase-II Study (Feasibility Study)

- Phase-II field work
- Phase-II home office work
- Explanation of Draft Final Report
- Presentation of Final Report

During the Phase-I Study, formulation of the Basic Development Plan was undertaken for the development of Agrarian Reform Communities in Marginal Areas. The selection of the Typical Model Areas for the implementation of the Feasibility Study was also made through the classification of Model Areas.

On the other hand, during the Phase-II Study, additional data collection and field work activities were undertaken focusing on the Typical Model Areas as mentioned above, and the Feasibility Study on the Project was undertaken.

## 1.3 Implementation of the Study

The Phase-I field work undertaken from March 4, 1996 to July 1, 1996 and the Phase-II field works from September 2, 1996 to January 29, 1997 were carried out in the Study Areas by the following Study Team members in close cooperation with DAR and other related Government staff.

Advisory Team

| | |
|---|---|
| - Mr. Yutaka Ohama | Advisory Team Leader |
| - Mr. Yoichi Nishio | Advisor (Agriculture) |
| - Mr. Mitsukuni Watanabe | Advisor (Rural Development) |

JICA Study Team

| | |
|---|---|
| - Dr. Junichi Kitamura | TeamLeader/RegionalDevelopment |
| - Mr. Seiji Takeuchi | Co-TeamLeader/Agricultural Infrastructure(1) |
| - Mr. Shunichi Hosono | Agricultural Infrastructure (2) |
| - Ms. Anicia C. Papa | Rural Sociology |
| - Mr. Yasunori Hasegawa | Agronomy |
| - Dr. Michio Nozaki | Farmers' Organization/Agricultural Extension |
| - Dr. Toshikazu Nagamitsu | Animal Husbandry |
| - Mr. Toshinori Kudo | Agro-Industry/Processing |
| - Mr. Somporn Hanpongpandh | Agro-Economy/Project Evaluation |
| - Mr. Antonio J. Alcantara | Environment |
| - Mr. Kazuo Furukata | Survey Supervision (1) |
| - Mr. Trino C. Gimenez | Survey Supervision (2) |
| - Mr. Akira Sudo | Coordinator |

Related DAR Officers

| | |
|---|---|
| - Mr. Jose Mari B. Ponce | Director, Project Development Management Staff (PDMS) |
| - Ms. Celerina G. Afable | Chief, Project Implementation and Management Division, PMDS |
| - Ms. Amelia M. Cosca | Chief, Project Development and Resource Mobilization Division, PMDS |
| - Ms. Jean M. Fornoles | Project Development Officer IV, PDMS |
| - Ms. Irma T. Canlas | Senior Agrarian Reform Officer, PDMS |
| - Mr. Roman Oida, Jr. | Project Development Officer III, PDMS |
| - Ms. Ranelisa Samiano | Project Development Officer II, PDMs |
| - Ms. Fatima Canares | ARO |
| - Ms. Julieta Silva | Project Development Officer II, PDMS |

| | | |
|---|---|---|
| - | Ms. Susana Evangelista Leones | Director IV, BARBD |
| - | Mr. Tomas Cabuenos | Director III, BARBD |
| - | Mr. Jose Soliva | SUARPO, BARBD |

# CHAPTER II. BACKGROUND OF THE PROJECT

# CHAPTER 2. BACKGROUND OF THE PROJECT

## 2.1 Socio-Economic Conditions

### 2.1.1 National Level

By the early 1970's, income in the Philippines in terms of real per capita GNP were greater than those in Taiwan, Korea and ASEAN countries. In addition, there was an acceleration of the country's GDP growth rates from 5.1 percent in the 1960's to 6.0 percent in the 1970's. Unfortunately, however, this acceleration did not lead to forging a viable and mutually reinforcing linkage between agricultural and industrial sectors, and between rural and urban areas. It is because the engine of growth in the 1970's was the construction sector for the provision of service industry such as hotels, condominiums and office buildings located mainly in Metro Manila. Thus, the construction boom in the 1970's did not directly benefit the majority of the population that lived in the rural areas.

During the 1980's, the other countries mentioned above grew at an average of over six percent per year, compared with the Philippine rate of less than one percent. The country still depends on agriculture as the most important source of employment that directly provides income to 45 percent of the country's labor force. Agriculture's direct contribution to national products amounted to about 22 percent of GDP (World Bank Report 1995). Agri-based industry accounted for another 13 percent. As much as one-third of value added in the service sector was also linked to agriculture.

This slow growth in the 1980's and early 1990's, coupled with the effects of political crisis and repeated natural disasters, left the Philippines behind other Asian countries, with its per capita GDP of only US$953 in 1994 compared with US$3,601 of Malaysia and US$2,411 of Thailand.

In the last three years, however, the country's economy has improved, due to among other things, stable supply of electricity generated at commercial power plants under BOT scheme, an increased foreign capital investment and resultant growth in export. This made GDP growth rates accelerated to 4.3 percent in 1994, 5.3 percent in 1995 and an expected figure of 6.7 percent for 1996, which is the highest since 1978. In addition, the completion of a structural adjustment program assisted by IMF is anticipated to contribute further to the current economic boom. These recent macro-economic developments have reflected poverty conditions in the Philippines. While East and Southeast Asia have been praised for its success in reducing poverty in the last two decades, the World Bank Development Report in 1990 once portrayed the Philippines a possible exception to this broad improvement. Now, there is an encouraging indication of improvements in poverty alleviation, evidenced by the recently published 1994 Family Income and Expenditures Surveys (FIES):

- Total family savings (income over expenditures) increased 2.1 percent in real terms between 1991 and 1994,
- Dissavings are only for those families belonging to the lowest 10 percent. This was in contrast to the 1991 results where families belonging to the first two deciles had dissavings,
- As a result of increased savings, families belonging to the highest 10 percent earned incomes 18.7 times higher than those of the lowest ten percent. In 1991, the income disparity was 20.6 times, and
- The country's poverty incidence decreased from 39.9 percent in 1991 to 35.7 percent in 1994.

It is commonly held that, after single-minded pursuit of GDP growth in the 1950s, there was a conscious change in development philosophy towards poverty alleviation in the 1970's and 1980's. Yet, it does not necessary mean that effective poverty policy and plans were actually implemented, or more precisely, could be implemented under the past economic condition.

The Philippine economy appears to be now on the road to sustainable growth. However, it is important for the country to channel its macro-economic gains into programs that support the Government's effort towards the improvement in the health status of the population and the development of human resources.

### 2.1.2 Regional Level

Each region of the Philippines is an integral geographical body that often has the unique historical background and socio-economic conditions. It is thus imperative that each region sets its own development objectives and formulates its own strategies and concrete projects. Nonetheless, there exists a developmental framework that rural regions in the Philippines have in common, and this section highlights such general framework at the regional level.

First, an ever unresolved issue for regional development in the Philippines (and many other developing countries as well) is the imbalance of income between large cities and rural areas. Half of the Philippine poor live in rural areas, and the urban poor originate, though not entirely, from extreme rural poverty which encourages migration of the rural poor to cities. The 64.5 percent of rural households were considered to live under poverty line in 1991, while the figure was 47.1 percent in urban areas. The former poverty incidence in rural areas worsened slightly from 63.7 percent in 1985, but the latter figure for urban area was an improvement from 52.1 percent of the same year. Farming households which accounted for about 45 percent of the total population in 1991, had the lowest average income among household groups classified by sectors.

Second, inadequate support systems, including infrastructure, credit, extension services, schools and health services, are both causes and effects of

underdevelopment in rural areas and thereby a critical issue in regional development. The low productivity of agricultural and non-agricultural activities in rural areas are not merely the result of market mechanism but certainly function of the lack of infrastructure and other social support.

Third, the need to better use land and other natural resources in an efficient but sustainable manner must be emphasized. The expansion of economic activities has often resulted in the observed misuse of the country's land and natural resources and the increased deterioration of the environment. Examples are soil erosion, forest destruction, water pollution and the depletion of marine resources. Sustainability is now clearly the key element in promoting regional development based on agriculture and other rural activities.

Fourth, although the majority of the rural poor are engaged in farming, "the poorest of the poor" are often landless and dependent on wage incomes from agricultural labor and others. They are the farm workers in sugarcane, rice and corn, forestry workers and small-scale fishermen. Regional development should shed light on improvement of their livelihood generation as well.

Finally, we have to be aware of socio-economic imbalance among and within regions. Poverty indicators reveal that poverty in regions such as National Capital Region and Central Luzon are less severe than other regions. Similar disparities are observed within each region between central cities and rural villages. These teach us the inadequacy of considering regional development in the simplistic context of the imbalance between urban and rural area, particularly between Metro Manila and other regions.

## 2.2 National Policy on Agricultural Development and Comprehensive Agrarian Reform Program (CARP)

### 2.2.1 National Level

In the Medium-Term Development Plan (1987-1992), the national policy was expressed as follows:

Agricultural and Rural Development

The development of agriculture will be given the highest priority in keeping with the goals of alleviating poverty and increasing employment opportunities and incomes in the rural sector.

The remaining bias against the agricultural sector stemming from the system of industrial protection shall be removed. A market-determined interest rate policy shall likewise be pursued to make rural financial institutions viable and to enable them to effectively mobilize savings in the rural areas. To reduce the costs of production to farmers, trade impediments to production inputs shall be removed. The government's primary role in agricultural pricing and marketing shall focus on providing marketing infrastructure and fostering competition in agricultural trading. Price support for rice and corn, however, will be an exception. This is to protect the farmers from the disruptive effects of international trading practices. Other needed support to agriculture such as credit, research, and extension services shall be provided. Agricultural support services shall be extended to the beneficiaries of the agrarian reform program to ensure increased productivity.

Agrarian Reform

The concern for equity and distributive justice shall be at par with the concern for economic productivity. Agrarian reform shall be the centerpiece of the effort towards distributive justice to ensure that the gains from agricultural growth are fully transmitted to small farmers. The previous land reform program shall be reviewed and redirected to give justice to those who till the land. The agrarian reform program will be expanded to areas where the poorest farmers are found and where tenurial problem exist. Idle and abandoned lands, private alienable and disposable lands, and lands sequestered and foreclosed by the government shall be integrated into the expanded reform program and shall be given priority in the distribution to qualified tillers.

The government shall delineate between the task of promoting agricultural productivity and the task of promoting land justice as a means of accelerating the implementation of distributive reforms. For a more successful program (i) peace and order conditions in the countryside shall be improved; (ii) concessions shall be granted by bidding; (iii) information on the availability of land and other natural resources shall be systematized and made fully accessible; and (iv) a system for

monitoring the impact of distribution programs shall be installed and made available for public scrutiny.

In the second Medium-Term Development Plan (1993-1998), the national policy and program were concretely summarized as follows:

Agriculture and Fisheries

- To increase government investments for basic infrastructure and services in the rural areas, especially irrigation and drainage, farm-to-market roads and post-harvest facilities,
- To strengthen agricultural research and development to improve productivity in the sector,
- To reduce tariff rates on agricultural inputs (such as animal bio-logistics, livestock and poultry breeders, and prawn feed ingredients) and on agricultural machinery,
- To undertake a seed development program to ensure the supply of quality stock seeds for palay, corn and vegetables,
- To strengthen and expand the agricultural credit guarantee and crop insurance programs,
- To adopt a land use policy that is consistent with agrarian reform objectives and that promotes the best use of land,
- To implement a community-based fishery management strategy, regulate fishing efforts within maximum sustainable yields, promote territorial use rights for small fisherfolk, intensify aquaculture and optimal utilization of offshore, deep sea resources and provide diversified occupational opportunities among marginal fisherfolk,
- To implement an integrated pest management program and stop the use of pesticides banned in other countries,
- To promote the production of high-valued commodities for the domestic and export markets, and
- To enhance the role and participation of women in agricultural and fisheries production and ensure that they enjoy an equitable share of benefits from development programs and projects.

Agrarian Reform

- To accelerate the land tenure improvement program through the following measures:

    . Adoption of more rational and simple operating procedures and a fair, expeditious and inexpensive settlement of agrarian disputes,
    . Adoption of a fair land valuation formula and prompt payment of just compensation to encourage landowners to cooperate and support agrarian reform; development of alternative schemes of landowner compensation to encourage landowners to invest in rural based industries that have strong linkages with agriculture,

. Adoption of a progressive tax on land to encourage smaller agricultural landholdings among large landowners.

- To promote partnership with non-government and people's organizations, LGUs and other support groups such as cooperatives, women's and youth organizations, academies and landowners at the provincial level for the speedy and effective implementation of CARP,
- To undertake an integrated and area-focused approach to CARP implementation through the development of agrarian reform communities (ARCs),
- To develop other sources of CARP financing for land tenure improvement and support services delivery, and
- To improve inter agency coordination by strengthening relations among the legislature, judiciary, local government units and particularly among CARP implementing agencies.

### 2.2.2 Regional Level

The following were quoted from the Medium Term Development Plan (1987-1992):

The country shall adopt an employment-oriented, rural based strategy to attain sustainable growth and development. The emphasis on development will not only rectify the widening gap in levels of development and income between the urban and rural sectors of the economy, but also enable the 60 percent of the population in the countryside to maximize their contribution to the economy.

A land reform program which includes a package of credit, marketing and technological support shall continue to be implemented. Priority shall be accorded to, and investments shall be encouraged in, labor-intensive, rural based, small-and medium-scale enterprises, particularly those engaged in the production of food for domestic consumption and of commodities for export.

There will also be a review of existing policies and structures that concern agricultural and rural development. An important ingredient to the increase in productivity is an improvement in technology. While the emphasis of rural based industries is on labor-intensive technologies which will provide more employment opportunities, efforts will be focused on developing various technologies which will improve quality, use substitute raw materials and adopt new production processes without necessarily increasing costs. At the same time, an extensive information dissemination campaign for different technologies and for upgrading worker's skill will be undertaken in the rural areas.

To support for rural development, greater emphasis shall be placed on the construction of rural based projects, such as, feeder roads, water supply system, feeder ports, school buildings, health facilities, communal irrigation and rural

electrification. The objective is to quickly improve agricultural production, increase rural incomes, and improve the living conditions of the rural population.

Environmental conservation shall be promoted through the minimization of the harmful environmental effects arising from the utilization of resources and from other developmental activities. This shall be undertaken through the full implementation of the environmental impact assessment (EIA) system in all environmentally-critical projects and the full enforcement of anti pollution laws. The conservation and protection of vital, unique and sensitive ecosystems, scenic landscape, cultural sites, and other resource areas shall, likewise, be a major concern. The country's natural heritage shall also be preserved.

The maintenance of peace and order, especially in the countryside, is an essential requisite for the effective execution of development programs.

### 2.2.3 Provincial Level

There are 76 provinces in the Philippines now. As a representation, the policy for one province is shown as follows:

The provincial ARC Development Plan is designed to answer the pressing needs of the province which is centered on rural poverty. With its vast resource potentials, the partnership between local government units, non-government organizations, people's organization and other support sector is strengthened to identify potential answer and opportunities which will benefit the marginal majority, which are mostly small farmers and are found to be agrarian reform program beneficiaries.

Within the agro-industrial framework, the CARP in the province will develop all the planned ARCs by 2000, where land distribution will be accelerated and public investments will be channeled. It is envisioned to address the problems brought about by poverty and economic insufficiency among the many farmer-beneficiaries on the CARP affected areas by way of providing them the needed skills and capability building programs, promotion of agri-based rural industries, provision of adequate needed infrastructures, and social and institutional support programs.

The provincial ARC Development plan is designed with the following strategies:

- Land acquisition and land distribution activities which are very essential in any agrarian reform program responsibilities,
- Enhancement of crop and livestock production and the provision of necessary support facilities,
- Social infrastructure building and strengthening to ultimately empower the ARBs and increase bargaining power through collective effort,

- Support on agricultural intensification and marketing efforts through quality physical infrastructure programs,
- Access to social services facilities and services aimed at improving quality of life of the beneficiaries,
- Generation of employment opportunities to provide supplementary income and proper utilization of natural resources, and
- Sustainability programs aimed at protection of environment and balanced ecology.

With the implementation of the provincial ARC Development Plan, it is envisioned to improve socio-economic growth, reduce poverty incidence projected at 35 percent, improve production system while preserving the ecosystem and develop the areas that would lead to an environment conducive for investment and rural industry.

The prospective funding sources are particularly the available local sources such as the government financial institutions like LBP, PNB and DBP; national line agencies like DPWH, DTI, DENR etc., local government units and the Countrywide Development Funds of congressional districts. For foreign funding, targets are the JICA and OECF of Japan, FAO-TSARRD and other foreign sources which may provide support to agrarian reform programs.

## 2.3. Progress of Comprehensive Agrarian Reform Program

### 2.3.1 Progress of the Program

The then, President Corazon C. Aquino proclaimed and enacted the Comprehensive Agrarian Reform Program (CARP) in July 1987 and signed into law, the CARP, in June 1988. This Program was planned to be completed within ten years, however, two and half years extended till the end of 2000. As of 1995, progress and rate of land distribution are indicated as follows:

1) Land Distribution:

| | Initial Plan (in 1987) | Modified Plan (in 1996) | Progress (End of 1995) | Progr Rate (to Modi Plan) |
|---|---|---|---|---|
| | (ha) | (ha) | (ha) | |
| a) Private Agri. Lands (Over 5 ha) | 3,265,100 | 3,085,727 | 962,780 | 31 % |
| 1) Operation Land Transfer (OLT) (Rice & Corn) | 727,800 | 607,084 | 466,185 | 77 % (by DAR) |
| 2) Other Agri-Lands | 2,537,300 | 2,478,643 | 496,595 | 20% (by DAR) |
| - Voluntary Offer to Sell(VOS) | | | 221,371 | |
| - Voluntary Land Transfer(VLT) | | | 197,552 | |
| - Compulsory Acquisition(CA) | | | 77,172 | |
| b) Gov t Owned Agri. Lands | 7,030,500 | 4,921,516 | 2,713,914 | 55% |
| - Gov t Owned Agri. Lands | 77,000 | 735,331 | 664,333 | 90% (by DAR) |
| - Settlement & Landed Estate | 478,500 | 646,583 | 564,603 | 87 % (by DAR) |
| - Public Alienable/Disposable Lands | 4,595,000 | 2,339,602 | 794,934 | 34% (by DENR) |
| - Integrated Land Social Forestry | 1,880,000 | 1,200,000 | 690,044 | 58% (by DENR) |
| Total | 10,295,600 | 8,007,243 | 3,676,694 | 46% |
| In which by DAR | 3,820,600 | 4,467,641 | 2,191,716 | 49 % |
| by DENR | 6,475,000 | 3,539,602 | 1,484,978 | 42 % |

Source: Report of Mr. M. Yagi, JICA Expert to DAR

2) Leasehold Operation:

In case there is a tenant farmer in the agricultural land within five hectare, the farm rent shall be the fix value corresponding to 25 percent of the annual mean net production value for the past three crop years.

| Items | Actual Results before CARP (1963-1986) | Actual Results of CARP (1987-1995) | Total |
|---|---|---|---|
| Leasehold Agri-Lands (Rice & Corn) | 527,999 ha (546,520 Cases) | 274,890 ha (238m,764 Cases) | 847,889 ha (785,284 Cases) |
| Leasehold Agri-Lands (Others) | 0 ha (0 Case) | 532,099 ha (260,024 Cases) | 532,099 ha (260,024 Cases) |
| Total | 572,999 ha (546,520 Cases) | 806,989 ha (498,788 Cases) | 1,379,988 ha (1,045,308 Cases) |

3) CARP Status in Marginal Areas

Total land distribution in the 12 Model Areas is 77.6 percent. Four ARC marginal areas have completed land distribution to farmer beneficiaries. These areas are Cofcaville ARC in Region II, Montilla ARC in Region III, Maulwin ARC in Region IV and Kipalili ARC in Region XI. The area with the least number of land distribution completion is Abierra ARC in Region VI (only 6 percent). The present land distribution status by Model Area are presented in Table 2.3-1.

### 2.3.2 Related Development Plans and Assistant Agencies

The following related projects and studies on the ARCs under the DAR have been undertaken with the assistance of different government agencies concerned. Detailed descriptions of the projects and studies are given in Annex Q.

- Technical Assistance to Cooperative Development in Agrarian Reform Communities (Technical Assistance), OECF Special Yen Credit
- Agrarian Reform Support Project (Capital Assistance), European Communities
- Agrarian Reform Infrastructure Support Project (ARISP) (Capital Assistance), OECF Yen Credit Package
- Belgian Agrarian Reform Support Project (Capital Assistance), Belgium
- Development of Agrarian Reform Communities in Marginal Areas (Technical Assistance), JICA
- Database Support to CARP (Grant Aid), JICA
- Support Activities to Indigenous Group in ARCs (Technical Assistance), FAO
- Australian Technology Support Program to ARCs (Capital Assistance), Australia
- Agrarian Reform Community Development Project (Capital Assistance) WB/IFAD/CIDA and Australian Aid
- Integrating Population-Related Concerns on Training and Extension System of the Department of Agrarian Reform (Technical Assistance), FAO-UNFPA
- Dutch Rural Development Assistance Program (Financial Assistance), Netherlands
- Land Reform Support Project (Nucleus Estate Outgrower Development Project) (Technical Assistance), World Bank-Managed Japanese Project Preparation
- Natural Resources Management and Development Projects (Technical Assistance), Australian International Development Assistance Bureau
- Joint DAR-DENR Reforestation Project (Technical Assistance), ADB-OECF

## Table 2.3-1 CARP Status by Model Areas

| | OLT | | VLT | | VOS | | CA | | Government Land | | KKK Lands | | Settlement | | Total Scope | Accomp. (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Scope (ha.) | Accomp. (%) | Scope (ha.) | Accomp. (%) | Scope (ha.) | Accomp. (%) | Scope (ha.) | Accomp. (%) | Scope (ha.) | Accomp. (%) | Scope (ha.) | Accomp. (%) | Scope (ha.) | Accomp. (%) | | |
| 1. Sappa-ac ARC Bangued, Abra, CAR | 68.90 | 100.00 | 29.45 | 6.20 | | | | | | | | | | | 98.35 | 76.70 |
| 2. Talugtog ARC San Juan, La Union, Region I | 44.19 | 100.00 | 0.66 | 0.00 | | | | | | | | | | | 44.85 | 98.52 |
| 3. Cofcaville ARC Maddela, Quirino, Region II | | | 155.00 | 100.00 | 32.30 | 100.00 | 25.10 | 100.00 | 21.10 | 100.00 | 95.80 | 100.00 | | | 329.30 | 100.00 |
| 4. Montilla Est. ARC Balanga, Bataan, Region III | | | | | 104.48 | 100.00 | | | | | | | | | 104.48 | 100.00 |
| 5. Maulawin ARC Calauag, Quezon, Region IV | | | 0.71 | 100.00 | 312.94 | 100.00 | | | | | | | | | 313.65 | 100.00 |
| 6. Pag-asa ARC Tinambac, Camarines Sur Region V | | | | | | | | | | | | | 300.00 | 94.00 | 300.00 | 54.61 |
| 7. Abierra Estate Altavas, Aklan, Region VI | | | | | 249.00 | 6.00 | | | | | | | | | 249.00 | 6.00 |
| 8. San Vicente ARC Trinidad, Bohol, Region VII | 10.13 | 0.00 | | | 375.00 | 100.00 | | | | | | | | | 385.13 | 97.37 |
| 9. Marangog ARC Hilongos, Leyte, Region VIII | | | | | 31.00 | 0.00 | | | 4.40 | 0.00 | | | 481.00 | 14.00 | 516.40 | 13.00 |
| 10. Silae ARC Malaybalay, Bukidnon Region X | 28.56 | 83.00 | | | 78.10 | 56.60 | | | 49.20 | 100.00 | | | | | 155.86 | 75.10 |
| 11. Kipalili ARC Asuncion, Davao, Region XI | | | | | 300.00 | 100.00 | | | | | | | | | 300.00 | 100.00 |
| 12. Mat-i ARC Surigao City, Surigao del Sur, Region XIII | | | 29.33 | 80.00 | | | 28.04 | 80.00 | | | 34.07 | 80.00 | | | 91.44 | 80.00 |
| Total | 151.78 | 96.82 | 215.16 | 72.37 | 1,482.82 | 75.85 | 53.14 | 180.00 | 74.70 | 28.25 | 129.87 | 73.77 | 781.00 | 48.30 | 2,888.47 | 77.56 |

Source: DAR - Provincial / Municipal Offices.

# CHAPTER III. PRESENT CONDITIONS OF THE STUDY AREAS

# CHAPTER 3. PRESENT CONDITIONS OF THE STUDY AREAS

## 3.1 Physical Conditions

### 3.1.1 Location, Area and Topographic Conditions

1) Location and Area

The Study Areas (Study Areas) for the Feasibility Study of Development of Agrarian Reform Community in Marginal Areas are located nationwide as shown in the location map. Initially, the Areas covered were 14 Study Areas. However, two Study Areas were excluded due to peace and order condition after discussion with DAR. The Study Areas are either situated within resettlement areas or declared as part of the Agrarian Reform Communities (ARC). The details of location and area are summarized as follows:

List of Study Areas

| Region | Name of ARC | Municipality / Province | Study Area (ha) |
|---|---|---|---|
| CAR | Sappaac ARC | Bangued, Abra Province | 375 |
| I | Talugtog ARC | San Juan, La Union Province | 167 |
| II | Cofcaville ARC | Madella, Quirino Province | 490 |
| III | Montilla ARC | Tuyo, Balanga, Bataan Prov. | 108 |
| IV | Maulawin ARC | Calauag, Quezon Province | 321 |
| V | Pagasa ARC | Tinambac, Camarines Sur Pro. | 307 |
| VI | Abiera Estate | Altavas, Aklan Province | 289 |
| VII | San Vicente ARC | Trinidad, Bohol Province | 456 |
| VIII | Marangog ARC | Hilongos, Leyte Province | 330 |
| X | Silae ARC | Malaybalay, Bukidnon Prov. | 164 |
| XI | Kipalili ARC | Asuncion, Davao Province | 327 |
| XIII | Mat-i ARC | Surigao City, Surigao del Norte | 200 |
| Total | | | 3,534 |

DAR has initially selected 28 ARCs in 14 Regions, based on criteria for assessing and prioritizing the specified Study Areas. Out of the 28 ARCS, 12 Study Areas were selected after discussions of the Study Team with DAR staff at the commencement of the Phase-I field work in the beginning of March 1996. The criteria for the selection of the Study Area are presented below:

First Set of Criteria

- Topography is rolling and sloping, ranging from five percent to less than 18 percent,
- Land area should be at least 100 ha or at most, 300 ha and contiguous,
- Economic activity of the study sites are limited,

- ARB income is below the poverty threshold,
- ARC is one of the priority areas for ARC development of the province.

Second Set of Criteria
- There is peace and order situation in the ARC or municipality,
- Crop cover of the marginal land is limited,
- Not so long distance and good accessibility to the study sites are expected, and
- There is willingness and readiness of the ARBs in providing the essential information.

Third Set of Criteria
- Political consideration and the municipal DAR' readiness and capacity to assist in the preparation of the Study.

There exist two types of land ownership for distribution, that is, the resettlement of land owned by the government while the other is ownership by private individuals. Both lands are distributed to Agrarian Reform Beneficiaries (ARBs) in the form of Certificate of Land Ownership Awards (CLOAs) or leasehold. In the resettlement, the mother CLOA is in the name of the government, while private ownership is in the name of individual beneficiaries.

2) Topographic Conditions

Topography of all the identified Study Areas are rolling and sloping. The elevation of the different marginal areas varies substantially from 40 m above sea level to more than 600 m. The slope of each area is basically between the ranges of five to less than 18 percent. However, some distributed lands are located in a topography with slope of more than 18 percent. Table 3.1-1 shows the slope of topography in the 12 Study Areas.

All ARCs are accessible by motor vehicle especially four-wheel drive vehicles, except for Pagasa ARC in Tinambac, Camarines Sur Province, wherein, about five km of roads are not passable due to knee deep mud.

### 3.1.2 Meteorological and Hydrological Conditions

Climate in the Philippines has been described in terms of rainfall distribution received in a locality. One such climate classification is the Modified Coronas. With the use of the average monthly distribution of rainfall at different stations, four types of such rainfall distributions in the Philippines were defined and the climate condition around the Study Areas are categorized into four types as shown below (see Figures E.1-1 and E.1-2):

Type-I: Two pronounced seasons, dry season from December to May and wet season from June to November. Maximum rain period is from June to September. Areas characterized by this climate type are generally exposed to the southwest monsoon and get a fair share of the rainfall brought about by tropical cyclones occurring during the maximum rain period.

Type-II: No dry season with a very pronounced maximum rain period in winter. Maximum rainfall generally occur in December and January, although there is not a single dry month. Areas characterized by this climate type are generally along or very near the eastern coast, thus, are open to the northeast monsoon.

Type-III: No very pronounced maximum rain period, with a short dry season lasting only from one to three months. This type is intermediate between the preceding two climate types, although it resembles the Type-I more closely because it has a short dry season. Areas of this climate type are partly shielded from the southwest monsoon and are also benefited by the rainfall caused by the tropical cyclones.

Type-IV: Rainfall is more or less evenly distributed throughout the year. This is also intermediate between the Type-I and Type-II, although it resembles the Type-II more closely since it has a dry season.

Table E.1-2 indicates the meteorological and hydrological characteristics around the Study Areas.

## 3.2 Administration, Socio and Farm Economic Conditions

### 3.2.1 Administration and Rural Organization

The overall supervision and policy direction of CARP is assumed by the Presidential Agrarian Reform Council (PARC) which is composed of the President of the Philippines as chairman and the Secretary of Agrarian Reform as Vice-Chairman. The following are members of CARP: Secretaries of the Department of Agriculture; Environment and Natural Resources, Budget and Management; Local Government and Interior; Finance; Public Works and Highways; Labor and Employment; Director-General of the NEDA; President of the Land Bank of the Philippines; Administrator of National Irrigation Administration; three representatives of affected landowners; and six representatives of the Agrarian Reform Beneficiaries (refer to Figure 3.2-1).

A Provincial Agrarian Reform Coordinating Committee (PARCCOM) is created in each province composed of a chairman (appointed by the President), the Provincial Agrarian Reform Officer as Executive Officer, one representative each from DA, DENR and LBP, one representative each from existing farmers organization, agricultural cooperative and non-government organizations in the province, two representative landowners and two representative from farmers and farmworker beneficiaries as members.

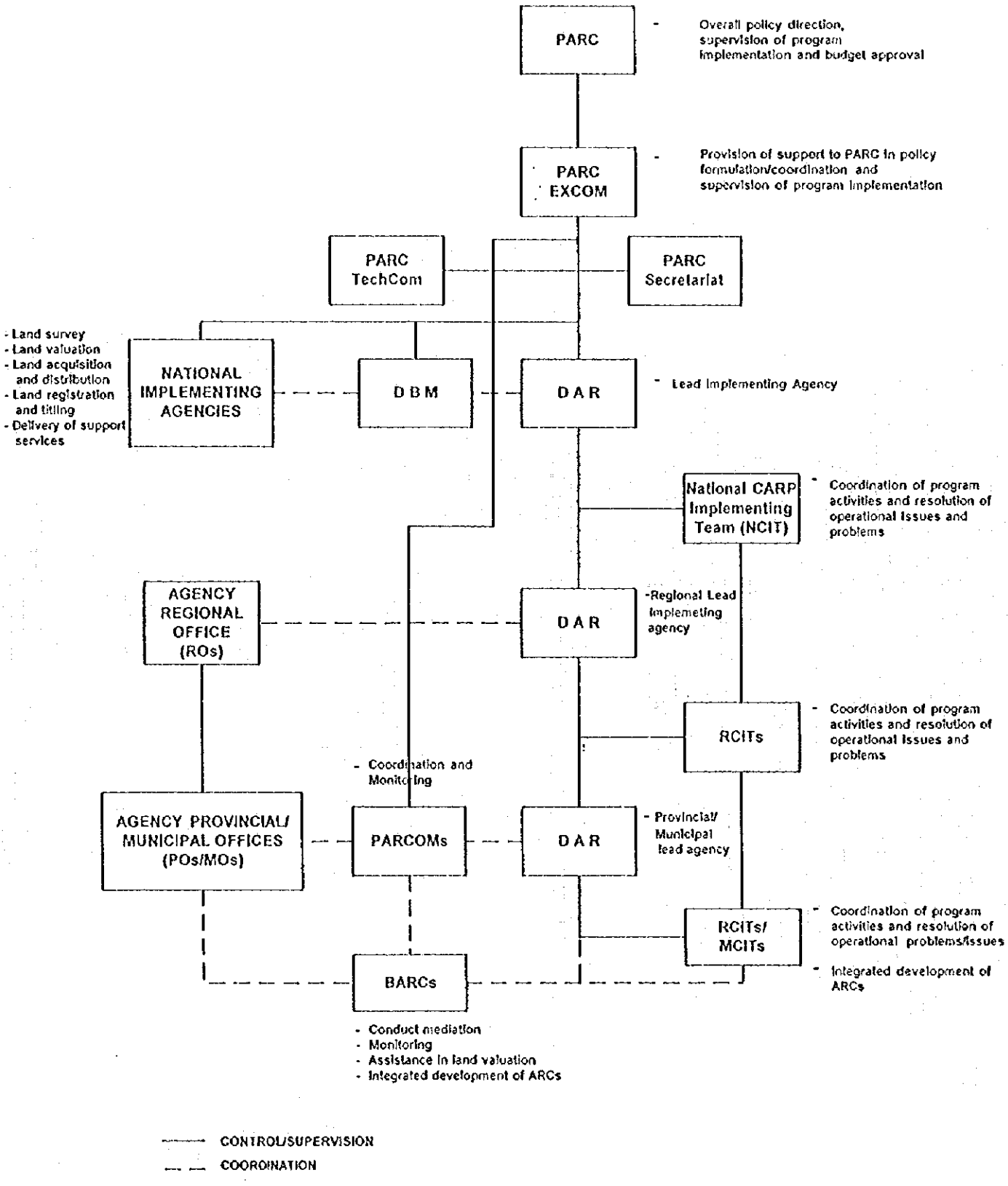
The PARCCOM coordinates and monitors the implementation of CARP in the province. It also provides information on the provisions of CARP, guidelines issued by the PARC and on the progress of CARP in the province.

The Barangay Agrarian Reform Council (BARC) is an implementing and coordinating mechanism at the barangay level on all matters related to agrarian reform. The BARC is usually composed of the following: representative of farmers and farmworker beneficiaries (leaseholders and share-tenants) farmworker non-beneficiaries, agricultural cooperatives, other farmer organizations, the barangay council, non-government organization, and landowners and also DA, DENR, officials assigned to the area; DAR ARPT/DF assigned in the area and Land Bank of the Philippines representative.

The PARCCOM and the BARC are the bodies involved in program coordination at the provincial and barangay levels, respectively. It is also the bodies involve in monitoring the activities of CARP implementing agencies and in pinpointing possible duplications.

There are also regional and provincial CARP Implementing Teams (CIT), composed of regional, provincial and municipal lead agencies, who spearheads the coordination and synchronization of CARP activities and resolution of operational issues at their respective levels.

## FIGURE 3.2-1 ORGANIZATION AND FUNCTIONAL STRUCTURE OF CARP



The Department of Agrarian Reform is the lead implementing agency in programs related to CARP. The DAR has national, regional, provincial and municipal offices established to synchronize support for the beneficiaries of the program specifically at the field level sites, i.e., the municipal community level or the agrarian reform communities (Figures E.1-2 to E.1-5).

The initiator of development at the field level lies with the DAR Municipal Agrarian Reform Officer (MARO) and the Agrarian Reform Program Technologists (ARPT)/Development Facilitator (DF).

The ARPT/DF in partnership with the NGO/PO takes the over-all lead in the development of the ARCs by initiating the involvement and participation of the local people in the development of their areas. This initial contact with the ARC is through the formal and informal leaders and through the BARC (where applicable as many BARC are not anymore functional). Together with the community organizer of the partner NGOs/POs in the ARC area, the ARPT/ DF undertake the role of facilitator, coordinator and manager in playing the role of enabling the people to participate in the development process.

The most important player in the development of the ARC are the people in the community. The DAR and the other concerned agencies, the NGOs/POs and private groups play supporting roles until such time when the people will be able to stand on their own.

The identified priority marginal areas are all governed by the existing administrative and rural organizations. However, the level of organization development differ in each area. Where BARCs are still functional and active, it becomes the entry point of organizational development. In instances where NGO/POs are present, the DAR undertake organizational development together with the NGO/PO. When these two are absent, the ARPT/DF takes the lead role in the organizational development of a given ARC area.

### 3.2.2. Population and Farm Household

The population and farm household of the 12 Study Areas are presented in Table 3.2-1. From the data presented, it can be seen that the Montilla ARC has the most number of population and farm household at the barangay level (2,611 and 479, respectively) while at the same time with the least number of farm household at the Study Area site (63 households only). Maulawin ARC has the most number of household within the Study Area. Pagasa ARC has no transient farm household, that is, the lands they till and their household residence are located within the marginal areas site. On the other hand, there are no farm households residing in the Mat-i ARC area due to the absence of rural and agricultural facilities and amenities. The farmer beneficiaries of Mat-i ARC reside in the barangay proper of Mat-i, about two to three km away. The farm households with farming activity in the marginal area are about 150, coming from the sitios of Hubasan and San Jose.

## Table 3.2-1 Population, Households and Farm Household by Model Area

| Name of ARC | Barangays Covered | | | Sitio(s) Covered | | IBI Population | | Farm Households | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Name of Barangay | IBI | Population | Name of SITIOS | Area Coverage | Total Population | IBI | Permanent | Transient | Total |
| 1. Sappa-ac ARC | Sappa-ac | 189 | 1159 | Sappa-ac Proper | F | 383 | 71 | 68 | 3 | 71 |
| Bangued, Abra, CAR | | | | Sappa-ac South | F | 381 | 57 | 50 | 7 | 57 |
| | | | | Pao | F | 305 | 46 | 46 | 0 | 46 |
| | | | | Fita | F | 51 | 9 | 9 | 0 | 9 |
| | | | | Parpaña | F | 39 | 6 | 6 | 0 | 6 |
| | | | | Total | | 1,159 | 189 | 179 | 10 | 189 |
| 2. Talugtog ARC | Talugtog | 161 | 896 | Sitio 1 | F | 174 | 31 | 30 | | 30 |
| San Juan, La Union, Region I | | | | Sitio 2 | P | 404 | 78 | 42 | 8 | 50 |
| | | | | Sitio 3 | P | 318 | 54 | 38 | 21 | 59 |
| | | | | Total | | 896 | 163 | 110 | 29 | 139 |
| 3. Cofcaville ARC | Cofcaville | 109 | 806 | Purok 1 | P | 207 | 46 | 32 | 14 | 46 |
| Maddela, Quirino, Region II | | | | Purok 2 | P | 126 | 28 | 26 | 2 | 28 |
| | | | | Purok 3 | P | 189 | 42 | 34 | 8 | 42 |
| | | | | Purok 4 | P | 284 | 63 | 29 | 34 | 63 |
| | | | | Total | | 806 | 179 | 121 | 58 | 179 |
| 4. Montilla Est. ARC | Tuyo | 479 | 2611 | Hacienda | F | 340 | 63 | 16 | 47 | 63 |
| Balanga, Bataan, Region III | | | | Montilla | | | | | | |
| 5. Maulawin ARC | Maulawin | 302 | 1700 | Tigas | P | 400 | 49 | 34 | 15 | 49 |
| Calauag, Quezon, Region IV | | | | Mangga | P | 336 | 58 | 51 | 7 | 58 |
| | | | | Centro | P | 644 | 116 | 100 | 16 | 116 |
| | | | | Baybay | P | 371 | 64 | 34 | 30 | 64 |
| | | | | Total | | 1,751 | 287 | 219 | 68 | 287 |
| 6. Pag-asa ARC | Pagasa | 142 | 817 | Zone 1 | F | 112 | 21 | 21 | 0 | 21 |
| Tinambac, Camarines Sur | | | | Zone 2 | F | 165 | 28 | 28 | 0 | 28 |
| Region V | | | | Zone 5 | F | 148 | 24 | 24 | 0 | 24 |
| | | | | Zone 6 | F | 133 | 27 | 27 | 0 | 27 |
| | | | | Zone 7 | F | 100 | 20 | 20 | 0 | 20 |
| | | | | Total | | 658 | 120 | 120 | - | 120 |
| 7. Abiera Estate | Cabugao | 288 | 1475 | Dalipdip | P | 19 | 3 | 3 | | 3 |
| Altavas, Aklan, Region VI | Dalipdip | 121 | 744 | Cabugao | P | 275 | 43 | 26 | | 26 |
| | | | | Cabangahan I | P | 416 | 65 | 26 | | 26 |
| | | | | Cabangahan II | P | 352 | 55 | 21 | 38 | 59 |
| | | | | Total | | 1,062 | 166 | 76 | 38 | 114 |
| 8. San Vicente ARC | San Vicente | 125 | 654 | Purok 7 (Fatima) | F | 1141 | 137 | 137 | | 137 |
| Trinidad, Bohol, Region VII | San Roque | 307 | 1734 | Bayanihan | P | 410 | 142 | 53 | 89 | 142 |
| | | | | Total | | 1,551 | 279 | 190 | 89 | 279 |
| 9. Marangog ARC | Marangog | 247 | 1309 | B. Proper | P | 598 | 98 | 96 | 2 | 98 |
| Hilongos, Leyte, Region VIII | | | | Caimito | P | 366 | 60 | 58 | 2 | 60 |
| | | | | Iba | P | 329 | 54 | 52 | 2 | 54 |
| | | | | Guintolian | P | | 35 | 32 | 3 | 35 |
| | | | | Total | | 1,293 | 247 | 238 | 9 | 247 |
| 10. Silae ARC | Silae | 231 | 1284 | Patang (Silae)1/ | P | 54 | 27 | 3 | 24 | 27 |
| Malaybalay, Bukidnon | Dalacutan | 96 | 332 | Tol-an (Silae)2/ | P | 18 | 23 | 0 | 23 | 23 |
| Region X | | 327 | 1616 | Dalacutan | P | 382 | 65 | 0 | 65 | 65 |
| | | | | Total | - | 454 | 115 | 3 | 112 | 115 |
| 11. Kipalili ARC | | 423 | 2468 | P2 | P | | 1 | | 1 | 1 |
| Asuncion, Davao, Region XI | | | | P4 Alegria | P | 210 | 31 | 31 | | 31 |
| | | | | P6 San Nicolas | P | 105 | 16 | 16 | | 16 |
| | | | | P8 Sta. Cruz | P | 105 | 16 | 16 | | 16 |
| | | | | P9 New Jagna | P | 161 | 25 | 25 | | 25 |
| | | | | P10 Crossing Jagna | P | 189 | 30 | 29 | 1 | 30 |
| | | | | Total | | 770 | 119 | 117 | 1 | 119 |
| 12. Mat-i ARC | Mat-i | 590 | 3181 | Hubasan | P | 371 | 70 | | 70 | 70 |
| Surigao City, Surigao del Sur, Region XIII 3/ | | | | San Jose | P | 424 | 80 | | 80 | 80 |
| | | | | Total | | 795 | 150 | - | 150 | 150 |

1/ Household resident is in Sitio Patang, however, farm area is in the marginal area.
2/ Household resident is in Barangay Dalacutan, however, farm area is in the marginal area.
3/ Farm households resident is in the Barangay proper of Mat-i, but farm area is in the marginal area.
Source: Conceived Development Plan by ARBs, DAR-DF,LGU

The majority of the farmer beneficiaries of Silae and Montilla Estate ARC are transient farm households, 47 out of 63 in the Montilla ARC and 112 out 115 in the Silae ARC. The farmer beneficiaries undertake their agricultural activities in the marginal area site during daytime and go back to their place of residence after the farming activity is completed and/or during night time, mostly at the barangay proper where rural amenities and facilities are available, such as, domestic water, roads, electricity, school, health center, etc.

Considering the results of the agro-socio-economic survey undertaken by the Study Team, the general characteristics of the farm household population are as follows (Tables F.1-2 to F.1-3):

- The average household size is 5.3 with the highest average household size as 7.0 (in Kipalili) and the lowest average household size as 4.5 (in Cofcaville). The Study Area with the largest household population size is located in Abiera ARC, about 17 family members. About 61 percent of the household composition are children,

- The survey reveals a labor force population (15-64 age level) of 62 percent, a young population (0-14 age level) of 34 percent and old population of (65 years and over) of four percent. The dependency ratio is 1:2

- The most number of population belong to the 15-19 age group (12.8 percent) while the least number belong to the 60-64 age group (2.4 percent). As to the 12 Study Areas, San Vicente ARC has the most number of young population with its highest population number at the 5-9 age group (17.3 percent), and

- There are more males (52 percent) than females (48 percent) in the 12 Study Areas with a male-female ratio of 1.08. However, in Sappaac, Kipalili and Mat-i ARCs, the number of females are slightly higher.

### 3.2.3 Land Holding and Land Tenure

Majority of the farm households of the 12 ARC sites are considered new farm owners being recipients of land transfer certificates from the CARP Program. Farmer beneficiaries were either given individual Certificates of Land Ownership Awards (CLOA) or Mother CLOA and become co-owners of land areas (Table 3.2-2). For farmer beneficiaries who are recipients of Mother CLOA, the title is issued to the whole land holding subject for tenancy which remains undivided. The farmer beneficiaries are co-owners of the land. Once the land/property is subdivided to respective farmer beneficiaries/co-owners, individual CLOA is issued. For those covered under the Operation Land Transfer Program, land certificates were also awarded to farmers. The average size of land distributed to the farm- owners ranges from less than one hectare (in Talugtog ARC) to more than five hectare (in Pagasa ARC).

## Table 3.2-2 CARP Beneficiaries by Land Tenure by Model Area

| Priority Area | Beneficiaries | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Mother CLOA | Indv. CLOA | EP | Lease-Holder | Owner Cultivator | Sub Total (Direct Beneficiaries | Farm Worker/ Potential ARB (Ind. Beneficiaries) | |
| 1. Sappa-ac ARC<br>Bangued, Abra, CAR | 5 | 2 | 39 | 68 | 46 | 160 | 29 | 189 |
| 2. Talugtog ARC<br>San Juan, La Union, Region I | - | 3 | 43 | 39 | 25 | 110 | 29 | 139 |
| 3. Cofeaville ARC<br>Maddela, Quirino, Region II | 9(62) | 51 | | | 36 | 149 | 30 | 179 |
| 4. Montilla Est. ARC<br>Balanga, Bataan, Region III | | 63 | | | | 63 | | 63 |
| 5. Maulawin ARC<br>Calauag, Quezon, Region IV | | 221 | | | | 221 | 66 | 287 |
| 6. Pagasa ARC<br>Tinambac, Camarines Sur<br>Region V | | 73 | | | | 73 | 47 | 120 |
| 7. Abiera Estate<br>Altavas, Aklan, Region VI | 11 (114) 1/ | | | | | 114 | | 114 |
| 8. San Vicente ARC<br>Trinidad, Bohol, Region VII | 1 | 259 | 19 | | | 279 | | 279 |
| 9. Marangog ARC<br>Hilongos, Leyte, Region VIII | 95 | 41 | 10 | | | 146 | 101 | 247 |
| 10. Silae ARC<br>Malaybalay, Bukidnon<br>Region X | 4(32) | 25 | 8 | | | 65 | 50 | 115 |
| 11. Kipalili ARC<br>Asuncion, Davao, Region XI | | 119 | | | | 119 | | 119 |
| 12. Mat-i ARC<br>Surigao City, Surigao del<br>Sur, Region XIII | | 54 | | 32 | 50 | 136 | 14 | 150 |

**Note:**

1/ Number of beneficiaries covered 114

The farm households of Sappaac ARC are mostly owner-cultivators (29%) and leaseholders (42%). Under the CARP, there were five Mother CLOA recipients and three individual CLOA recipients and 39 EP holders. These farmers are considered as new farm owners. The average landholding of the Sappaac farmers is 1.48 ha.

For the Talugtog Study Area, however, land tenure varies as there are identified owner-cultivators (formerly from the EP program) of about 43 (or 39%); leaseholders of about 39 (or 35%) and the rest are new farm owners and recipients of individual land certificates (CLOA). The average area of farm is less than one ha (about .74 ha.). The majority of farmers in the Cofcaville ARC are new landowners with an average farm size of 2.06 ha. These farmers are recipients of individual CLOAs (51 farmers) and nine mother CLOAs with 62 beneficiaries. The number of owner cultivators in the area are 36 (or 24%).

The Abiera Estate beneficiaries, on the other hand, are also new land-owners and are recipients of 11 Mother CLOA. Of these 11 Mother CLOA, 114 farmers were listed as co-owners with an average farm holding of about 1.57 ha. The Pagasa Study Area is part of the Camarines Sur settlement area with an average landholding of 5.44 ha. The majority of the land areas in the Study site has been distributed to the farmers with only 25 ha for distribution.

The San Vicente farmer beneficiaries are mostly recipients of individual CLOA (259 of 278). About 19 of 278 are EP holders. The average landholding of farmers is 1.56 ha.

All farmer beneficiaries of Montilla, Maulawin, and Kipalili Study Areas are individual CLOA recipients, new farmer beneficiaries with average farm size ranging from 1.64 to 2.47 ha.

The Silae ARC beneficiaries are Mother CLOA recipients (4 Mother CLOA with 32 co-owners), individual CLOA recipients (25) and EP holders (8) and are considered as new land holders while Mat-i beneficiaries are recipients of KKK programs, direct payment scheme and compulsory acquisition. The average size of landholding in Silae is 3.10 ha while in Mat-i is 5.44 ha.

### 3.2.4. Living Conditions

Majority of the identified Study Areas are inaccessible during the rainy season, the most notable of which are the Pagasa, Abiera and Marangog ARCs. The residents of these three areas are isolated from the rest of the barangay and from the poblacion after the ocurrence of a prolonged and heavy rain. During this period, farmers go to the poblacion or nearest market by walking. Transportation becomes available at the nearest accessible barangay, at Concepcion for Marangog ARC and Tamban for Pag-asa ARC. Kipalili ARC is also inaccessible during the wet season. However, motorbikes can still be used as mode of transport to and

from the highway. Sappaac, Maulawin and Silae ARCs can be reached by any mode of transport at all times due to the presence of an all-weather barangay road. For Pagasa and Abiera ARCs, it can also be reached by using water navigation. However, there is still the need to walk about one to two km to reach the marginal area site. Generally, the more interior parts of the marginal area sites are mostly trails or dirt roads and becomes not passable during the wet season.

Major facilities availed by the farmer beneficiaries are mostly located at the barangay proper, such as, elementary school, barangay health centers, multi-purpose centers and pavements, day care centers and even sources of drinking and domestic water uses. This is one reason why farmers from Mat-i and Montilla ARC prefer to live in the barangay proper and not in the marginal area where their farms are located.

Even with the presence of health centers, the farmer beneficiaries go to the public or private hospitals/clinics in the poblacion for serious illnesses and other medical services and facilities. Midwives and barangay health workers who are assigned to the barangay health clinics undertake activities only once week and in some cases, only once a month. For other areas, the local doctor or "arbularyo" is also consulted for health related services. This is commonly practiced in Marangog, Pagasa, Kipalili, Silae and Montilla ARCs.

Only Talugtog has no elementary school. Though San Vicente and Dalacutan (for Silae ARC) has a school, it only offers first and second grade education. Three areas have secondary education (Maulawin, Montilla and Mat-i). For most of the school age population, secondary and college education can be availed of only in the poblacion. Montilla has the highest number of college graduates (18.1 percent) followed by Mat-i (9.2 percent), while Pagasa, Talugtog and Abiera has the most number of high school graduates, 15.4, 14.3 and 13.6 percent, respectively (Table I.1-6).

Agricultural activity is limited for lack of rural and agricultural infrastructures and facilities, such as irrigation and farm-to-market roads. Cultivation of crops is limited because of the dependency of the farmers on rainfall. Rainfed farming is practiced resulting to very low yields. Production is basically for home consumption. Aside from farming, farm households raised livestock and poultry. The majority of the farmers are upland farmers working on heavily sloped lands cultivating small plots planted to rice, corn, coconut, vegetables, rootcrops, banana, etc., often with techniques that contribute to very high rates of erosion. This is most common in all marginal areas, the best example of which is the Silae area.

The major expenditure item for all farmer beneficiaries is on food. Other major expenditure items are for education, medical expenses, clothing, transportation and home improvements, in that order.

It is only in Silae where reported conflict with former land owners arose. It was indicated by the farmer beneficiaries that a minority group, the Lumads are claiming ownership of their lands causing some conflict and friction in the area. In some of the Study sites, boundary conflict was the most common cited problem.

### 3.2.5 Farm Economy and Poverty Conditions

1) General Farmers Conditions

The results of the survey reveal the following general conditions of farmers in the Study Areas:

First, most of the land are infertile and hence, non-cultivated. The planted acreage fluctuates yearly depending on the amount of rainfall, and other natural conditions which vary seasonally and annually. Typical crop land is below two hectares. The land being cultivated is partly left idle. The cropping pattern and planted acreage are shown in Table I.1-6. In addition, the opportunities for employment are very limited in the non-farm sector of most regions. The typical farmer's main agricultural products are palay and sweet potato in wet season and corn in dry season. Coconut is the main crop throughout the year. The productivity and farm price of rice are very low. Its average yields estimated from the survey results are only 1.37 ton/ha and 1.24 ton/ha, respectively, for wet and dry seasons. These figures are far below the national average. The farm technologies employed by the farmers are generally traditional, and most of them still rely on domestic animals like carabaos and cattles.

The introduction of new technology is difficult due to limited access to loan credits, extension services, and market facilities. In all, their farm income is too low to sustain the entire family.

Second, social and cultural marginalization and oppression such as shortage in basic needs provision are still crucial among most farmers. The provisions of drinking water, health service and transportation are limited or hardly accessible.

2) Farm Income by Region

A farm interview and questionnaire survey was administered by the JICA Study Team to a sample of 50 farm households in each of the 12 selected areas in the Philippines. There is a substantial disparity of farm household income between the national average and that in the survey areas. The income of most households in the Study Areas are so low that they can be classified as poor in the Philippine context. The average farm household income is 32,044 pesos per annum (see Table O.1-1).

Moreover, income disparities among the various regions are very wide, 105,376 pesos per annum in Region III against 8,478 pesos in Region VI, a wider than 10 to 1 gap. As to their total income, those in Regions I and III rely heavily on non-farm income, from wages and allowance or gifts from relatives. This explains why the total income in Regions I and III are relatively higher than those of all other regions, where non-farm employment opportunities are limited and income from cash crop is the major source of income. On the average, a farmer works approximately 100 to 150 days per year on his own farm. Though there exist labor work, it is much more often irregular, temporary or on daily basis, so that the working style is vulnerable and limited in participation.

On the other hand, data on farm expenditure show imbalances in the revenues and expenditures of farmers in most selected areas (see Table 3.2-3) except those in CAR, Regions I and III. Since most farmers are not in favor of borrowing money to meet either the surplus household expenditure or their farm inputs, there is a need to probe further how they did or plan to do it from their limited income.

Therefore, more detailed research to include farmers' household survey should be conducted to investigate further the specific conditions of each farmer in terms of their economic activities, and reflect them in the project planning.

3) Poverty Condition and Incidence

In 1995, a report by the National Statistical Coordination Board indicates that the total annual per capita poverty threshold in 1994 was 8,969 pesos. The incidence of poor families was 35.7 percent of the population, with the actual number of poor families approximately 4.6 million. The annual per capita poverty threshold means the minimum annual per capita income required by a family unit, or the amount a family unit would spend to satisfy its nutritional requirements and other basic needs. The number of families below the threshold, expressed as a proportion of the total number of all families, is the poverty incidence.

Nevertheless, one should keep in mind that all measures using the threshold figure should base their analysis on the concept of absolute poverty. Within different income groups in each region, inequality should be analyzed to reflect the comparative nature of poverty. A regional comparison between the selected areas and the national totals are summarized in Table O.1-3. Based on said figure, poverty in the Philippines is widespread. Incomes in Regions I and III are relatively higher than those from the national statistics. This is due to the fact that there are better job opportunities for non-farm employment in these two regions which is the key to their high income level. The survey indicates that poverty incidence is highest in Regions VI, VIII and XI, where average income are far below the national standard.

Table 3.2-3 Comparison with Annual Income and Expenditures per Household by model Areas

| Model Area | Total Income | Total Expenditure | Total |
|---|---|---|---|
| 1. Sappa-ac ARC, Bangued Abra,CAR | 35,117 | 22,136 | 12,981 |
| 2. Talugtog ARC, San Juan La Union, Region I | 54,205 | 49,191 | 5,014 |
| 3. Cofcaville ARC, Maddela Quirino, Region II | 31,397 | 36,637 | (5,240) |
| 4. Montilla ARC, Tuyo, Balanga Bataan, Region III | 105,376 | 91,821 | 13,555 |
| 5. Maulawin ARC, Calauag Quezon, Region IV | 28,434 | 37,011 | (8,577) |
| 6. Pagasa, Tinambac Camarines Sur, Region V | 24,839 | 34,682 | (9,843) |
| 7. Abiera Estate, Altavaz Aklan, Region VI | 8,478 | 24,913 | (16,435) |
| 8. San Vicente ARC, Trinidad Bohol, Region VIII | 22,929 | 28,866 | (5,937) |
| 9. Marangog ARC, Hilongos Leyte, Region VIII | 13,251 | 24,848 | (11,597) |
| 10. Silae ARC, Malaybalay Bukidnon, Region X | 24,632 | 34,025 | (9,393) |
| 11. Kipalili ARC, Asuncion Davao Del Norte, Region XI | 13,682 | 19,581 | (5,899) |
| 12. Mat-i ARC, Surigao City Surigao Del Norte, Region XIII | 22,183 | 36,702 | (14,519) |
| Average Balance | | | (4,657.50) |

Source: Farmer's Agro-Socio-Economic Survey, JICA Study Team, 1996

The survey results also show that three regions in Visayas have the highest proportion of poor families in the Philippines. Lack of basic physical and social infrastructure further worsens the plight of the poor farmers in the selected areas. In summary, the rural poor tends to belong to the relatively young age and those with small farms and low educational attainment. In most regions except Region III where some hold college certificates, the rate of school enrollment is quite low with most attending only elementary schools. This may be one reason why most of the poor families are generally characterized by limited access to employment.

## 3.3 Agricultural Conditions

### 3.3.1 Soil and Land-Use

1) Soil

According to the soil map prepared by the Bureau of Soils and Water Management( BSWM), 12 kinds of soil types are identified in terms of great groups of the American soil taxonomy within the 12 Study Areas. These soils belong to any order of Inceptisols, Entisols, Alfisols, and Ultisols or any of their combinations. The estimated soil fertility by soil type are shown in Table F.1-3. The number of Study Areas by category of soil fertility are as follows;

| Category of Soil Fertility | No. of Study Areas |
|---|---|
| Moderate | 7 |
| Low to moderate | 4 |
| Low | 1 |

Source: see Table F.1-3

The range of stoniness and gravel content are estimated based on the number of respondents to total number of the sample farm households in the Rural Socio Economic Survey. The general soil characteristics of the marginal areas and their problems are shown, as follows;

- The soils of "Moderate Fertility" could relatively be easily managed by applying adequate nitrogen and phosphate fertilizer. However, the soils of "Low Fertility" require comprehensive soil management, including remedy on soil acidity,
- The top soils are shallow due to soil erosion, and
- Some stony and gravely soils are found which are mostly accompanied by severe soil erosion.

Although most of the soils in the Study Areas have less suitability to grow most of annual crops in general as compared with the soils of non marginal areas, tree crops are well suited to these soils. These soil characteristics have to be taken into account in the planning of the agricultural development in marginal areas.

2) Land Use

The present land use in each Study Area is preliminary estimated on the basis of the topography map and the data provided by DAR. Of the total Study Area of 3,534 ha, there are 1,519 ha of cultivated area (43 percent of the total area) and 2,015 ha of cogonal/shrubs and other areas (57 percent of the total area). The other areas include residential area, forest and other areas (Table 3.3-2).

The cultivated area is further divided into 407 ha of rice land, 434 ha of cultivated area with annual upland crops, and 678 ha of perennial crop land. The perennial crop area has the largest share, while the upland and rice land covers about 28 and 27 percent, respectively, of the total cultivated area. The rice land exists in almost all Study Areas, with the largest area covered by the rice land in the Sappaac ARC.

Based on the results of Rural Socio Economic Survey, the following findings on the present land use are observed:

- In the 12 Study Areas, about 46 percent of the sample farmers have indicated that they have insufficient land to cultivate. About 30 percent of total sample farmers responded that even less than three ha area is not sufficient. However, the remaining 70 percent of sample farmers consider more than three ha area as sufficient,

- About 58, 37, 29, and 12 percent of the total sample farmers cited inadequate soil fertility, stone and gravely soils, steep land, and inadequate soil moisture, respectively, as considered problems on cultivation of land, and

- The other considered problems are damage caused by animals and birds/insects, shallow top soils, and others (soil erosion, non accessibility, lack of animal power).

According to the rural economic survey, the average farm size in terms of the distributed and cultivated area for the 12 Study Areas are 1.77 ha and 0.76 ha, respectively. The difference between the two figures at 1.01 ha, means the lands that are left idle or the non-cultivated lands (refer to Table F.1-6). The reasons cited why farmers have non-cultivated lands in the marginal area are inadequate soil fertility, lack of animal power, intensively required labor in cultivation, non-accessibility, lack of soil moisture, and others. Even though the CARP beneficiary has adequate land to cultivate, more than 20 percent of the distributed land are still left as idle land. For the maximum utilization of the idle land, development must include not only such infrastructure projects as roads, small scale irrigation, and drainage, but also such development as, soil conservation measures and introduction of sloping agricultural land technology (SALT).

### 3.3.2 Crop Production

1) Crop and Cropping Pattern

a) General

It is reported that the total volume of rice import by the Philippines by the end of June, 1996 will come to more than 800,000 ton. The farmgate price of paddy in April, 1996 increased to as much as P9.20 per kg, 34.9 percent higher than the P6.82 price in April, 1995. Also the farmgate prices of yellow and white corn also increased. They are about 26 and 33 percent, respectively, higher than the prices of the previous year (1995). This means that the farmgate prices of these grains are considerably at high level, reflected by the short supply of these grains nationwide. Although most of the grain crop production are limited to self subsistence level in the marginal area, the farmers have signified very strong interest on grain production.

b) Crops in the Study Areas

Major crops grown in the Study Areas by season are shown in Table 3.3-1. All these crops are grown under rainfed conditions. The main crops grown during wet season are paddy rice in rice land and corn, and root crops in the upland. Paddy rice, corn, vegetables, and beans are also grown in rice land and upland during dry season. Corn is planted as main crop during the dry season in upland while paddy rice and vegetables are also grown during dry season in the areas where rainfall is almost evenly distributed.

Most of annual crops are grown for self subsistence. Only corn and some wet season vegetables like squash and gourd are raised as cash crops in selected Study Areas, particularly (in Montilla and Talugtog ARCs and are rather grown on a larger scale) where the local market is located near the area. In Cofcaville and Silae, where a large scale upland area are found, corn covers most of the cultivated area, both during the wet and dry seasons. Generally, the corn crop areas during the dry season are less than that of the wet season for lack of soil moisture.

Perennial crops are dominant in most of the Study Areas. The major perennial crops grown are coconut, banana, and mango, found in most of the Study Areas. Other perennial crops grown are cacao, coffee and abaca. The outstanding character of the commercial perennial crops are identified as follows based on the collected information gathered during the field survey:

- Mango plantation area tends to increase throughout the marginal area and their surrounding areas. Especially, the mango planted area is increased in Abra province, where high quality mango are produced because of favorable climate. However, dreadful citrus diseases which are transmissible by budding and insect vectors, are infesting the whole country,

## Table 3.3-1 Present Crop Production

| Model Area | Item | Unit | Paddy (Wet) | Paddy (Dry) | Corn (Wet) | Corn (Dry) | Beans Vegeta-bles(Wet) | Vegetab-les,Tob-acco(Dry) | Beans (Dry) | Root Crop (Wet) | Subtotal | Coconut | Banana | Mango | Citrus | Cacao | Coffee | Abaca | Subtotal | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Sapsac, Bangued | Area | ha | 88 | | 91 | | 2 | 13 | 12 | 21 | 143 | | 3 | 5 | | | | | 8 | 151 |
| Abra | Yield | ton/ha | 1.20 | | 1.50 | | 5 | 1.30 | 0.40 | 1.50 | | | 5.80 | 2.60 | | | | | | |
| CAR | Productio | ton | 106 | | 14 | | 10 | 17 | 5 | 32 | 184 | | 17 | 13 | | | | | 30 | 214 |
| 2. Talugtog, San Juan | Area | ha | 78 | | 3 | 1 | 2 | 2 | 5 | | 91 | 10 | | | | | | | 10 | 101 |
| La Union | Yield | ton/ha | 1.00 | | 2.00 | 1.08 | 2.10 | 2.50 | 0.20 | | | 0.98 | | | | | | | | |
| Region I | Productio | ton | 78 | | 6 | 1 | 4 | 5 | 1 | | 95 | 10 | | | | | | | 10 | 105 |
| 3. Cafeaville, Maddera | Area | ha | 32 | 13 | 155 | 124 | 8 | | 16 | 8 | 356 | | 18 | 5 | | | | | 23 | 379 |
| Quirino | Yield | ton/ha | 2.50 | 1.80 | 2.50 | 1.90 | 0.20 | | 0.60 | 2.00 | | | 3.10 | 0.50 | | | | | | |
| Region II | Productio | ton | 80 | 19 | 388 | 236 | 2 | | 10 | 16 | 751 | | 56 | 3 | | | | | 59 | 810 |
| 4. Montilla Estate, Tuyo | Area | ha | | | 7 | | 30 | | | | 37 | 4 | 10 | 27 | | | | | 41 | 78 |
| Bataan | Yield | ton/ha | | | 0.59 | | 1.82 | | | | | 1.43 | 1.11 | 0.01 | | | | | | |
| Region III | Productio | ton | | | 4 | | 150 | | | | 154 | 6 | 11 | 1 | | | | | 18 | 172 |
| 5. Maulawin, Calauag | Area | ha | 62 | 46 | | 4 | 4 | | 6 | 6 | 128 | 38 | 4 | 2 | 40 | | | | 84 | 212 |
| Quezon | Yield | ton/ha | 1.45 | 0.82 | | 1.19 | 5.00 | | 0.30 | 0.37 | | 1.23 | 0.80 | 0.50 | 1 | | | | | |
| Region IV | Productio | ton | 90 | 38 | | 5 | 20 | | 2 | 2 | 157 | 47 | 3 | 1 | 40 | | | | 91 | 248 |
| 6. Camarines Sur Resett. | Area | ha | 20 | 15 | | 4 | | | | 9 | 48 | 155 | | | | | | | 155 | 203 |
| Tinabac, Camarines Sur | Yield | ton/ha | 1.67 | 1.33 | | 1.71 | | | | 0.78 | | 0.73 | | | | | | | | |
| Region V | Productio | ton | 33 | 20 | | 7 | | | | 7 | 67 | 113 | | | | | | | 113 | 180 |
| 7. Abiera Estate, Altavaz | Area | ha | 15 | 14 | | | | | | 6 | 35 | 64 | 21 | | | | | | 85 | 120 |
| Aklan | Yield | ton/ha | 0.94 | 1.00 | | | | | | 0.76 | | 0.45 | 0.48 | | | | | | | |
| Region VI | Productio | ton | 14 | 14 | | | | | | 5 | 33 | 29 | 10 | | | | | | 39 | 72 |
| 8. San Vicente, Trinidad | Area | ha | 57 | 37 | 19 | 11 | 5 | | | 35 | 164 | 54 | 7 | | | | | | 61 | 225 |
| Bohol | Yield | ton/ha | 1.47 | 1.36 | 1.74 | 0.61 | 5.00 | | | 1.90 | | 0.66 | 1.10 | | | | | | | |
| Region VII | Productio | ton | 84 | 50 | 33 | 7 | 25 | | | 23 | 222 | 36 | 8 | | | | | | 44 | 266 |
| 9. Marangog-Leyte, | Area | ha | 24 | 14 | | 39 | | | 9 | 13 | 99 | 86 | 12 | | | | | 17 | 115 | 214 |
| Hilongos, Leyte | Yield | ton/ha | 0.50 | 0.50 | | 0.50 | | | 0.50 | 2.00 | | 0.49 | 2.20 | | | | | 0.30 | | |
| Region VIII | Productio | ton | 12 | 7 | | 20 | | | 5 | 26 | 70 | 42 | 26 | | | | | 5 | 73 | 143 |
| 10. Silae, Malaybalay | Area | ha | 7 | 3 | 68 | 69 | 3 | | | | 150 | | | | | | | | 0 | 150 |
| Bukidnon | Yield | ton/ha | 1.30 | 1.20 | 1.80 | 1.30 | 7.50 | | | | | | | | | | | | | |
| Region IX | Productio | ton | 9 | 9 | 122 | 90 | 23 | | | | 253 | | | | | | | | 0 | 253 |
| 11. Kipalili, Asuncion | Area | ha | 17 | 8 | 26 | 19 | | | | 2 | 72 | 13 | | 5 | | 2 | | | 20 | 92 |
| Davao Del Norte | Yield | ton/ha | 2.29 | 3.33 | 0.4 | 0.56 | | | | 1.10 | | 0.31 | | 0.33 | | 0.66 | | | | |
| Region | Productio | ton | 41 | 26 | 10 | 11 | | | | 2 | 90 | 4 | | 2 | | 1 | | | 7 | 97 |
| 12. Mat-i, Surigao City | Area | ha | | | | | | | | | 0 | 45 | 24 | | | | | 5 | 74 | 74 |
| Surigao Del Norte | Yield | ton/ha | | | | | | | | | | 0.20 | 0.04 | | | | | 0.22 | | |
| Region XIII | Productio | ton | | | | | | | | | 0 | 9 | 1 | | | | | 1 | 11 | 11 |

Source: Study Team

- The plantation of citrus, green orange (dalanghita) has increased considerably in the Maulawin ARC and neighboring areas. However, a dreadful disease for citrus infesting the country is transmissible by budding and insect rectros,

- The existing coconut plantations in Maulawin and Pagasa ARCs were severely damaged by typhoon "Rosing" in 1995. A large volume of the fallen coconut trees are processed into coconut lumber and are shipped to the market, in Manila and neighboring areas,

- Introduction of a large scale contract basis coffee production is proposed for the Camarines Sur Resettlement Area including the Pagasa ARC by the Department of Agriculture. According to the information provided by DAR Regional Office in Region V, the trial result on the introduction of coffee in the area is quite promising. In the Northern and Southern Mindanao regions coffee plantation areas have recently increased. Both Davao and Cagayan de Oro cities have large scale coffee buying stations,

- Once, cacao was considered as one of the major cash crops in Kipalili ARC. However, the production has gone down due to change of climate from even rainfall to uneven rainfall, having no drying facilities, and

- There are many farmers who plant fast growing trees or timber trees, like gmelina (Gmelina arborea Roxb.), acacia mangium giant ipil-ipil (Leucaena, leucocephala $D_E$, Wilt), mahogany (Swietenia Macrophylla King) or narra (Pterocarpus spp.). At present, the gross income of gmelina is estimated at about P50,000 per ha per year, due to tight marketing in timber supply.

2) Cropping Intensity

The cropping intensity in the Study Areas vary from about 28 percent to 92 percent with an average intensity of 58 percent where the distributed area are counted at 100 percent as shown in Table F.1-6. The small cropping intensities are found in the Study Areas where cogonal land and cultivated area with perennial crops cover a large area.

3) Crop Production and Yield

a) Crop Production

Copra, corn, paddy, and banana are major products, while the production of cacao, coffee and abaca are quite limited. Yellow corn is grown in Luzon island, while white corn is mainly grown in other marginal areas outside Luzon. Aside from the above crop production, fast growing trees are grown in some of the Study Areas (Table F.1-8).

b) Unit Yield and Crop Damages of Major Crops

The unit yield of major crops in the Study Areas are considerably lower than the national average as shown in Table F.1-7. Particularly, the unit yields of paddy rice, mungbean, and coconut are extremely lower than the national average. These crops are grown under rainfed conditions in the Study Areas. Also, annual crops are moderately and severely damaged not only during dry season but also during wet season due to lack of soil moisture. The less fertile soil may be another factor for the low yield. Moreover, it is reported that the farmers in the Study Areas have encountered several disasters and hazards, such as, landslide, soil erosion, grass fires, pest of locusts, wild animals, birds and others.

### 3.3.3 Farming Practices and Input Supply

1) Farming Practices

Basically, traditional cultivation practices, such as land preparation, planting, transplanting and weeding are performed by most of the farmers. For instance, carabaos are mostly employed for land preparation. However, there are many Study Areas where only less than 50 percent farmers own carabaos. They hire carabaos from other farmers while some farmers cultivate manually. Besides corn, traditional crops and local varieties are dominantly grown applying very limited amount of chemical fertilizers and pesticides. In the marginal area, almost all farmers have no post harvest equipment and facilities. Harvest is done manually and drying is done mostly by using mats and screens.

2) Input Supply

Accessibility in the Study Areas are difficult that agricultural technologists seldom visit the Areas. Therefore, extension activities, as, transfer of technology, supply of farm inputs for demonstration purposes and extension of vaccination services for animals are limited in the Study Areas. Lack of capital is another reason why farmers do not apply adequate farm inputs. Supply of organic fertilizers are also limited because of the limited number of livestock and poultry.

There are scarce water for nursery as well as for propagating seedlings during the initial stage of planting in the orchard. This is the main reason why the fruit and fast growing seedlings are not adequately available.

### 3.3.4 Animal Husbandry and Fisheries

1) General

Within the agriculture sector, the livestock and poultry sub-sector makes up about 13 percent of the gross value added in the agricultural sector. Despite its

on-going importance in the national economy and its central role in many Philippine farming systems, livestock and poultry productions have not attained the level needed or expected. Since it failed to provide enough meat for the rapidly growing population, importation was therefore allowed by the government. Approximately 28 percent of the protein requirement of Filipinos are derived from meat and poultry. The per capita meat consumption in the Philippines was 19.74 kg in 1989 and 20.89 kg in 1990.

Within the livestock category, the swine and poultry sectors are relatively well developed and ably represented by large integrators, medium and small scale growers, influential trade associations and other industry participants. Pork production went up as Foot and Mouth Disease (FMD) was gradually eradicated in some Luzon Provinces. The beef sector, by contrast, has not been organized effectively and has shown a steady decline in cattle number and economic importance, while dairying has never reached the economic take off point. As a result, these two latter sectors still lack the resources and organizational framework necessary for sustained growth. At the same time, economic growth and rise of consumer income, particularly in the urban income, will continue to bring increasing demand for beef and dairy products. Livestock production trend in the country is shown in Figure G.1-1.

2) Livestock and Poultry Population

The time series data on the livestock and poultry population are shown in Table G.1-1 and diagrammatically in Figure G.1-1. The three species which has exhibited significant growth are goats, chicken and ducks, where numbers have grown by nearly five percent annually over the past decade. The shortfall in beef supply has been partially made up of imports of Australian feeder cattle which reached 74,672 in 1993 as well as by imports of processing beef. Feeder cattle imports are at best a stop-gap remedy, however, and one which could be rendered uneconomical at any time by an unfavorable shift in exchange rates of higher prices for Australian cattle. One recent change in the sourcing of manufacturing beef has been occasioned by the Department of Agriculture's approval for the importation of Indian buffalo meat which corresponds to local carabeef.

3) Regional Differences in the Livestock Production

Livestock and poultry keeping is generally distributed throughout all regions of the country (Table F.1-2). However, there are significant differences in the livestock farming situation by region. Northern Luzon as a center of cattle and carabao production areas such as cow-calf operation is distant from the major Metro Manila market for livestock products, and livestock producers are largely captive to a well organized trading system that isolates them from direct marketing opportunities.

Central Luzon qualifies as a growth area due to the presence of organized livestock farmers and significant livestock numbers and feed resources, as well as proximity to the Manila Market.

Southern Luzon, now incorporated in CALABARZON is a traditional center for livestock. This is largely due to it's proximity to Metro Manila markets.

Visayas is the site of the second largest and fastest growing urban market, in Cebu. The Visayas can become the source of livestock and feedstuff primarily for the Cebu market. It can also supply other regional market centers in the Visayas and eventually compete with Metro Manila market. The southern island of Mindanao, is one of the few places in South East Asia that is officially declared free from Foot and Mouth Disease (FMD). It has a local feed base considered as possibly the best in the nation. Mindanao is one of the traditional centers for cattle production in the Philippines. Their outstanding leadership and activism will make this a good area for Philippine livestock industry.

4) Livestock Farming in the Study Area

Livestock farming plays an important role in the complex and interdependent farming systems in the marginal areas of the Philippines, where traditional livestock farming suffers from lack of drinking water for livestock, feed and fodder deficits, disease problems, poor genetic potential of indigenous livestock, improper selection programs and lack of marketing facilities. Therefore, outreach research strategy for livestock is needed to address all of these problems.

a) Cattle and Carabao

In the Study Areas, cattle and carabao form an integral part of paddy production in providing draught for haulage, in weed control, provision of manure in the fields and beef production. In most of the marginal lands, farmers provide a store of wealth and access to liquid cash by way of animal sale for meat.

Carabao is used principally for draught purpose in paddy cultivation and transportation. Some farmers keep these carabaos for their own power needs, while others hire surplus draught animals. The Bureau of Animal Industry (BAI) dispersal programs commenced some 20 years with the most recent distribution made in the 1980's. It appeared that distributions were politically motivated and the introduced cattle and carabao were mismanaged and died from diseases or were slaughtered for food. The level of livestock husbandry knowledge among marginal land farmers is low.

b) Goats

Goat farming forms an important and integral part of small holder agriculture in the country. This is shown by the fact that 99 percent of the goats in the country are in the hands of small farmers. Like carabao farming, goats has also

been a traditional form of livestock activity among the Study Areas, particularly in the dry and upland areas. The goats are generally herded with unutilized family labor, often the females of the household or the children. They are subsidiary source of livelihood for large number of small and marginal land farmers. They also contribute by way of skin and manure. However, the browsing habit of goats can also be a great disadvantage. If allowed to browse uncontrolled, they often will kill bushes and young trees by eating off all the leaves and the young shoots. In this way, plantations can easily be destroyed and soil erosion made inevitable.

c) Pigs

Major contribution to meat production in the country is by pig. Most of the marginal land farmers keep few indigenous breeds. The performance of indigenous breeds is evaluated under local sustainable conditions as they are well adapted to heat stress, disease resistant, and low energy diets. However, cross breeding with exotic breeds is going to the main plank for improving growth efficiency and carcass composition. Pigs are raised for communities' consumption under random breeding and scavenge system with little attention to feeding and husbandry.

d) Poultry

Poultry meat has the second largest percentage of country's total meat output. It is interesting to note that the growth in the production of native chicken substantially outpaces the growth in human population. This tasty and chewy bird continue to be in demand and is typically at premium prices to commercial broiler. This versatile bird performs many other functions including entertainment, speed control on country side roads, transmitter of poultry diseases, diversion for the family dog, insect control and waste management.

e) Inland Fisheries

The tilapia is as one of the most popular and most widely distributed aquaculture species in the Philippines. Tilapia culture has already been started by some farmers in some of the Marginal Areas. Beside, the integrated agricultural projects introducing pig and tilapia production is promising. However, this integrated farming should be limited to some special zones in order to avoid overproduction of tilapia.

### 3.3.5 Post-Harvest Conditions

The 12 Study Areas are not yet fully developed. Post-harvest facilities are very few, due to many constraints, such as, limited cultivable lands, steep and rolling lands which are not suitable for the production of large number of produce and for the selection of varieties for marketing, lack of technology to increase yield,

quality control of the product, quality standards as well as the prepared price escalation systems suitable to quality and limited marketing channels.

Detailed existing units of the post-harvest equipment and facilities in the Study Areas are shown in Table G.1-2. The equipment and facilities for rice and corn, which are the staple food in the Philippines, has become gradually popular. Of the 12 Study Areas, Talugtog in Region I, is the most developed in terms of post harvest facilities, having multi-purpose pavement (MPP), rice mill, rice thresher, hand tractor (kuliglig), reaper and corn sheller. However, these facilities are not sufficient considering the scale of the area. No post harvest equipment and facilities are found in Montilla in Region III, San Vicente in Region VII and Mat-i in Region XIII. In these areas, activities such as threshing, drying, shelling, etc. are usually done manually. Drying of crops are done in front of the farmers house using mat and others.

Since there are no special processing equipment or post-harvest facilities in some or most of the marginal areas, cash crops, such as, coconut, mango, banana, citrus, cassava, cacao, abaca, etc. are sold at the farm gate or at the market as raw materials. Some coconut are processed to copra by means of drying under sunlight or furnace on the ground. As some farmers in the areas have intention to increase these products, necessary post-harvest equipment and facilities must be introduced in the near future.

As marketing standards, the selling of palay would require less than 14 percent of moisture content. But since the moisture content is not usually measured by the moisture meter at the selling points, no one knows the actual moisture content of the sold palay. Therefore, there are actually no price difference of sold paddy at the market place as to variety, contents of debris, unit weight and crack rate. At present, some amount of rice-marketing are conducted by the National Food Authority (NFA) which buy palay at eight pesos per kilogram as standard price at the NFA processing centers. Buying price is not variable by the difference of the quality, and since the number of the NFA centers and their acceptable amount are limited, the centers are only usually available to the adjacent bigger farmers and traders. Usually, farmers in the marginal areas sell the palay to the middlemen or traders as dried palay, but for home consumption farmers go to the nearest rice millers, which are usually located at the poblacion or the center of the barangay, in some cases far from the marginal areas, to have their palay milled at cost base. Milling cost may be 10-20 pesos per 18 kilograms, variable depending on the rice millers and the location. Since the price of white rice and bran in the municipalities ranged from 16 to 18 pesos per kilogram and five to six pesos per kilogram, respectively, it might be profitable for the cooperatives in the marginal areas to own a rice mill. Considering a one pass type rice mill may be sufficient. However, for profitability, even a small one-pass type rice mill would require more than 200 days per year of work. As such, these should be more than 2,240 persons to consume it with an average consumption of 150 kilograms per person per year.

Rice post-harvest and processing are usually done by means of harvesting machine, winnower for reduction of the debris in rice, equipment and facilities for drying up to 14 percent of moisture content and rice mill to obtain white rice. However, in the Study Areas, harvesting is done manually. Reduction of debris is conducted by means of natural wind and moisture reduction is carried out by means of MPPs or mats made of grass or nylon under fine natural conditions. Mechanical dryers are not found in the Study Areas, because mechanical dryers need electricity and fuel oil and may be costly, if not enough amount of palay are available for drying.

Corn is sold as grain and moisture content of which is less than ten percent. Shelling and drying of corn are carried out by farmers themselves. Very few farmers shell the corn using shelling machines. Drying of corn before and after shelling is done on the MPPs or mats during fine days.

Owing to limited marketing channel, the present condition of the Study Areas is that traders or middlemen generally come to buy at the farm gate. Some traders or middlemen, aware of the lack of capital for production of the farmers, lure the precious product from the poor farmers on the bases of pre-matured sale. Farmers in the Study Areas are obliged to sell at lower price, because of not enough capital and limited transportation.

As to banana selling conducted by the Abiera ARC in Region-VI, some cooperatives collect and select the produce of the farmers at their own collecting centers, sell to the market themselves and sometimes join with other cooperatives for securing the quality of product, stability of selling price and income generation.

### 3.3.6 Marketing of Agricultural Products

Like other countries, marketing of farm produce plays a very crucial role in the agricultural production of the rural Philippines. Despite this, most government and private marketing institutions are located in the urban centers. Neither do they provide transportation to pick up farmers' produce in the barangay. Belonging to the marginal areas with low productivity, farmers in the Study Areas do not have their own transport to carry their produce to the market. Such marketing problem is one of their constraints.

The results of the Rural Socio-Economic Survey recently conducted in the 12 Study Areas show that most (73 percent) of the farmers sell their produce to the local traders. Very few (0.03 percent) sell to the National Food Authority (NFA) as their last resort. In Region II, farmers only sell their produce to the local traders. This indicates limited market access for the farmers and excess monopolistic power of the local traders who are free to dictate the prices paid for the farmers' produce (Table K.1-1).

More than half (59 percent) of the farmers are found not being paid reasonable price for their produce while nearly a fourth (21 percent) of them reported receiving good prices. Two reasons were given for not receiving reasonable prices : (i) transportation problem (71 percent); and (ii) the greed of the traders (40 percent). Other constraints reported are bad road condition; absence of irrigation facilities; absence of warehouse and bridges; non-access to market information and appropriate technology; and lack of related infrastructures (refer to Table H.1-2).

To identify more agricultural marketing constraints in the rural areas, there is a need to conduct further studies on institutional market outlets, institutional marketing arrangements, reduction and prevention of post-harvest losses, and possibly strengthening of farmers associations or cooperatives.

### 3.3.7 Research and Extension

1) Research Organization and Its Activities

Agricultural research and development in the Philippines is being carried out by the research organization in the Department of Agriculture (DA) and its attached agencies, the International Research Organization, University of the Philippines Los Banos (UPLB) and State Universities and Colleges (SUCs).

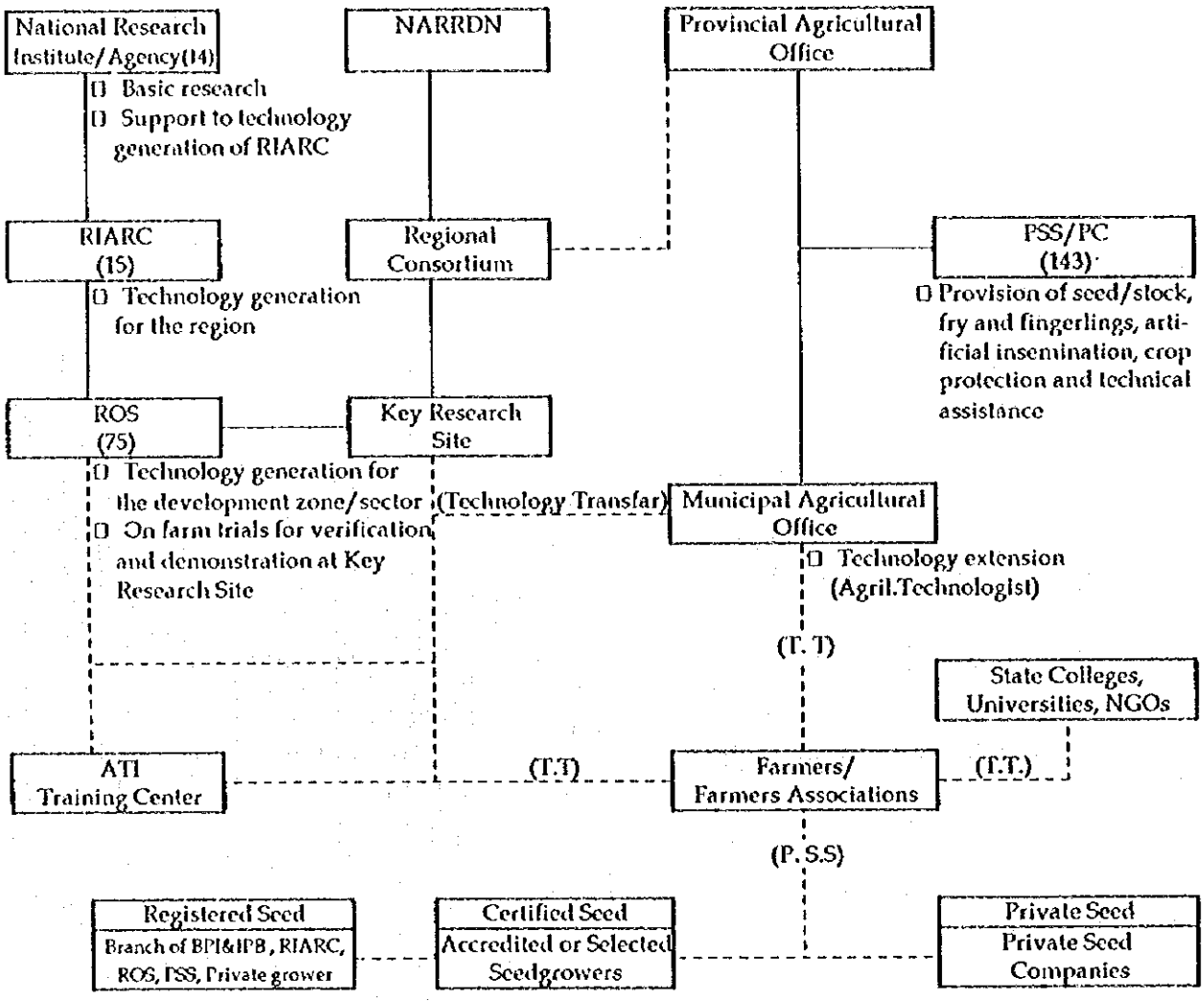
a) Research and Development Activities at DA

At present, the research and development activities of the DA are being carried out by four Bureaus and 20 National Research Centers (NRCs) in the Bureaus, three attached agencies and 14 NRCs in the agencies, 15 Regional Integrated Agricultural Research Centers (RIARCs) and 75 Research Outreach Stations (ROSs).

After the decentralization in 1991, a total of 663 Regional Research and Extension Stations (RRESs) under the DA were portioned out into three categories, that is, the RRESs retained by DA (15 RIARCs and 75 ROSs), the RRESs retained by the Local Government (143 PSS: Provincial Service Station) and the RRESs phased-out or given back to the donors. The structure of DA, the four research bureaus at the DA and the three attached research agencies are as follows.

- Bureau of Agricultural Research (BAR)
- Bureau of Plant Industry (BPI)*
- Bureau of Postharvest Research and Extension (BPHRE)*
- Bureau of Animal Industry (BAI)*
- Bureau of Fisheries and Aquatic Resources (BFAR)*
- Agricultural Training Institute (ATI)
- Philippine Rice Research Institute (PhilRice)*
- Philippine Carabao Center (PCC)*

FIGURE 3.3-1 ORGANIZATION AND SYSTEMS OF RESEARCH, TECHNOLOGY DEVELOPMENT AND EXTENSION




..... Flow of Technology / Seeds/Seedlings
( ) Number of Institute/Center/Station/Staff

T.T : Technology Transfar
P.S.S : Providing Seeds/Seedlings
BPI: Bureau of Plant Industry
IPB: Institute of Plant Breeding,UPLB
RIARC: Regional Integrated Agricultural Research Center
ROS: Research Outreach Station
ATI: Agricultural Training Institute
NARRDN: National Agricultural Resources Research Development Network
PSS/PC: Provincial Service Station / Production Center

- Livestock Development Council (LDC)
- Fertilizer and Pesticide Authority (FPA)
- Fiber Development Authority (FDA)*
- Philippine Fisheries Development Authority (PFDA)
- National Meat Inspection Commission (NMIC)
- Philippine Dairy Corporation (PDC)

* Research Organization

The 34 NRCs (Table H.1-4) pursue basic research programs of national importance in support to the technology generation activities of all RIARCs.

The 15 RIARCs (Table H.1-5) located in each of the political regions serve as nerve centers for technology generation to support the specific development thrusts of the region under technological support of the above bureaus and agencies.

The 75 ROSs (Table H.1-6) has the responsibility of validating technology relevant to specific needs of the development zone or sector in each region. ROS is the Key Station for on-farm trials in the region. The practical technology developed in the ROSs are verified at the Key Research Sites using farmers' fields concurrently with demonstration to visitors such as extension workers and farmers (Figure H.1-1). As such, ROS becomes the focal point for interaction among the farmers, extension workers and researchers.

The 143 PSSs which consist of at least one to three PSSs, located in each of the provinces, provide the services to promote commodities production, such as, provision of seed/stock, fry and fingerlings, artificial insemination, crop protection and technical assistance. They are under the direct supervision and control of the Provincial Agricultural Officer (PAO).

b) Plan and Coordination of Research and Development

PCARRD

The Philippine Council for Agriculture, Forestry and National Resources Research and Development (PCARRD) has been established to decide the direction of national agricultural research as a quick response to agricultural policy. The Organization is under the jurisdiction of the Department of Science and Technology (DOST)

BAR

The Bureau of Agricultural Research (BAR) corresponding to the Agriculture, Forestry and Fisheries Research Council of Japan, has the responsibility to plan, coordinate, evaluate, integrate, monitor and source funds for DA research activities. It is also tasked to maintain effective

linkage system with various DA regional staff bureaus, attached agencies and special projects as well as other research institutions within the national research system. Moreover, the BAR coordinates the manpower training and national research symposium of the DA research system.

Regional Consortium

To effectively carry out the agricultural research and development in the region, the Regional Consortium has been organized with the membership of the regional DA, DOST, DAR, DENR and SUC in each of the 15 regions.

c) Research in SUCs

Agricultural research is also performed at UPLB and SUCs, but the research focuses more on advance research related to technology generation, and less on research on extension-oriented or on-farm research .

d) Research Subjects and Problems

Since 1989, BAR has published a quarterly publication 'Farming Update' which carries applicable technology developed by DA. The publications are used as training materials at ATI every year. The practical technology developed in the last five years is largely biased to rice and maize, and less on fruits, vegetables and flowers. The technology on agricultural development on marginal land is only eight out of 131 subjects, that is, four for soil conservation in slope areas, three for cropping system and one for water source development.

Agrarian reform is one of the most important national project in the Philippines. However, the greater part of the lands released so far to landless farmers are marginal lands which has severe farming conditions, such as, isolated areas far from the market, rainfed area with poor water source and slope land with cogonal vegetation. Due to such severe conditions, some settled farmers give up the acquired land.

For agrarian reform to succeed, the government should reinforce research and development for the marginal areas, such as, development of stable rainfed agriculture, effective reclamation of cogonal land, development of hillside (sloped land) farming, agro-forestry and agro-silvo-forestry etc. together with the development of basic infrastructure and institutional support, which are indispensable for the development of marginal lands.

e) Research Organizational System and Its Problems

Research and technology development for the regions are left to the 15 RIARCs and 75 ROSs. It seems to appear that the ROS is the most important organization being the key station for applicable technology development and extension of the technology to the area. However, since the ROS's past experience

is based on production farm for seed, stocks, livestock and fry, the facilities, the research apparatus and equipment are extremely inadequate, and the budget and the personnel are not enough.

There is, therefore, a need to strengthen the facilities, the budget and the staff of RIARCs and ROSs along with closer organizational linkage between the ROSs/ RIARCs and the National Research Centers. At present, to increase staff capacity, ATI has conducted staff training of ROSs and RIARCs every year on methods of planning of field experiment and statistical analysis of data.

For reference purposes, the staff members, the activities and the budget of the CVIARC-ROS in Bagabag, Region II is shown below:

- Staff member:

| | |
|---|---|
| Station Master: | 1 |
| Planning & Administration: | 1 |
| Research & Development: | 1 |
| Field Operator: | 1 |
| Technical Assistance: | 1 |
| Clark: | 1 |
| Farm Worker: | 3 |
| Temporary Employees: | 16 |

- Activities:
  - Research Project
    (1) fruit tree, (2) farming system, (3) vegetable, (4) livestock
  - Development project
    (1) germplasm production and maintenance, (2) fruit foundation, (3) carabao breeding and production, (4) goat breeding and production
  - Plant Material Production

| | |
|---|---|
| (1) fruit seedling: | 3,000 seedlings / year |
| (2) forest tree: | 1,500 seedlings / year |
| (3) vegetable seedlings: | 2,000-5,000 seedlings / year |
| (4) nitrogen fixing trees: | Ipil-ipil, Miline |

Support Activities (Training)

| | |
|---|---|
| (1) Municipal Agricultural and Fishery Councils: | 30 personnel (2 p x 15 times) |
| (2) Farmers: | 150 personnel |
| (3) Municipal Technician: | 75 personnel (15 p x 5 times) |

- Budget(1995):

| | |
|---|---|
| Regular Program: | P. 790,000 |
| Augmentation: | 388,000 |
| Total: | 1,178,000 |

2) Technology Extension System and Its Activities

Agricultural technology extension system in the Philippines uses T&V (Training and Visit) System before 1991, where the extension activities in the areas are undertaken by the national government extension workers trained at ATI. After the decentralization in 1991, the system was divided into two, that is, the training activities undertaken by the ATI of the national government and the extension activities done by the local government. Consequently, a mutual agreement on the extension technology became necessary between the national and the local government. Generally, the extension activities lacked unity among the regions because of budget condition and the degree of understanding on the extension activities of each region.

Though the main organization of technology extension to farmers is ATI and municipal agricultural offices, each research and development organizations and SUCs also has its own extension activities. Hence, it is necessary to adjust contents of technology to be included and considered among these organizations.

a) Training Activities by ATI and ROS

ATI has four national training centers, 13 regional training centers, 17 farmers' training centers and seven regional fishermen's training centers in the country. It enforces training of staff member of RIARCs and ROSs at the ATI, extension workers, farmers and fishermen at the regional training centers every year (Figure H.1-2 and Figure H.1-3).

In 1994, the ATI has trained 2,231 agricultural technologists, 418 seed inspectors, and 300 agricultural engineers on the different aspects of grains production along with integrated pest management, post-harvest technology and project self reliance. It has also trained 2,099 DA/Local Government Units personnel on farming systems, cooperative development, income generating project, and extension methods and approaches (Annual Report, ATI 1994). The ATI has trained 15,686 farmers/farm families, 3,598 cooperative members on post-harvest technology in Grains Production Enhancement Program and 27,174 farmers/fisherfolks on regular courses in 1994 (Annual report, ATI 1994).

Training activities are also conducted at ROSs (Figure H.1-1). The CVIARC-ROS (formerly Tapaya Stock Farm) trained 75 Municipal Extension Staff in 1995.

The contents of training programs carried out by the ATI and the ROS are mainly on cereal production technology. However, there is a scarcity of programs on farming in marginal land. The contents should be improved so as to meet farmers' needs.

b) Extension Activities by Municipal Agricultural Office

Technology extension activities on the areas are carried out by the extension workers from the municipal agricultural offices, being about 13,000 personnel in the country with eight personnel on the average at each municipal agricultural office.

For example, the staff members at the agricultural office of Maddela Municipality, in Quirino are 14, composed of one Agricultural Officer, eight Agriculturists, four Agricultural Technicians and one Farm Supervisor, with nine out of 14 as extension workers. It is essential for the technology extension activities in marginal lands to fully provide sufficient number of motorbikes and increase the number of extension workers along with improving their capability.

c) Extension System and Problems

Agricultural Support Services Needed by Farmers

According to the results of the agro-soci-economic survey, the most necessary support services for the farmers is crop production technology (88 percent) followed by farming technology (87 percent), information on new seeds/seedlings (80 percent), supply of seeds and seedlings (79 percent), and livestock raising technology (79 percent). On the other hand, farmers' request for supply of production materials such as fertilizers and agricultural chemicals were only seven percent. Judging from the above results, it can be said that the farmers strongly want technological supporting services rather than support of production materials (Table I.1-7).

Farmers' Response to Support Service Activities

The farmers' evaluation of the support service activities gave the best score to the DAR, that is, 57 percent of the farmers found satisfactory with the supporting activities of DAR for land acquisition, followed by the Provincial and Municipal Office, with 37 percent of the respondents satisfied with the production technology support provided by them. Eight percent of the respondents found the NGO activities are satisfactory (Table I.1-8).

About 51 percent of the sample farmers replied that they are satisfied with the supporting services and about 25 percent of the sample farmers complained about the extension services provided by the above organizations. The reasons of dissatisfaction were little or no technical support (18 percent), seldom visit (7 percent) and lack of knowledge (two percent).

In order to carry out better support service activities, the following should be improved:

- Leveling up of extension workers capability through an efficient training fit to the farmers' needs,
- Provision of sufficient number of motorbikes and increasing the number of extension workers, and
- Building up a closer coordination between the national and local governments, and between the research and administration organizations.

3) Supply System of Seeds/Seedlings and Animals

A quick supply or dispersal of adequate seeds/seedlings and animals needed by farmers is essential for improvement of farming. The breeder seed, the purest class of seed of a given variety which is used for further seed multiplication of foundation seeds, is developed at PhilRice, IRRI and the University of the Philippines, Los Banos (UPLB) for rice, in IBP, Ilagan Agricultural Experimental Station and Agricultural Colleges on compound maize and in IPB and Economic Garden for ground nut. The foundation seed coming from the breeder seed is reproduced by the breeder seed producers and national crop centers. The registered seed is produced by government organization network and accredited selected seed growers. The certified seed is produced by accredited individual farmers, members of cooperatives/associations, cooperatives or private seed companies from registered seed. The hybrid seed of maize is produced by private seed companies, such as, Pioneer, San Miguel and East West. According to the Crop Production Division, BPI, at present, around 70 percent of vegetable seeds and 60 percent of fruit seeds/seedlings are being supplied by private companies.

### 3.3.8 Agricultural Credit

Nearly two thirds (64 percent) of all loans granted to agriculture in the Study Areas between 1988-94 were accounted for by the commercial banks. These commercial lendings, however, are normally limited to highly collaterized loans which are beyond the capacity of the rural poor and most small farmers. Besides, the commercial banks do not usually lend to small rural borrowers due to the high costs and risks involved. As a consequence, the bulk of rural poor and small farmers are left with excess demand for the credits they badly need.

Only 7.5 percent of agriculture loans in the past five years was accounted for by thrift banks, including private development banks, savings and mortgage banks, and savings and loan associations. A large part of such loans are provided by private development banks which acquired funds from the Development Bank of the Philippines (DBP) for term lending to medium-scale agri-based industries.

In the rural economy, rural banks are playing significant roles in development as they mobilize more of their resources and reinvest more in the rural areas. This is unlike the commercial and thrift banks which tend to mobilize more resources from the rural areas rather than reinvesting in them. Over the last five years, rural banks have accounted for about 13 percent of loans granted to

agriculture. However, the financial position of the most rural banks are relatively weak due mainly to the failure of the Masagana-99 Agricultural Credit Program during 1973-81. Under this program, over 80 percent of loans were not recovered.

Recently the Government launched the Farmer-Friendly Loan Packages aimed at encouraging farmers to shift to high value crop. The package was initiated by the Landbank of the Philippines (LBP) which has successfully loaned as much as 2.26 billion pesos in 1990 and 10.14 billion pesos in 1995 to small farmers. LBP charges a low interest rates of 10 - 12 percent per annum. In addition, the program is attractive in terms of its high loan ceiling and minimal documentation requirement.

However, these attractive credits are not available in the Study Areas. As a result, the majority of the farmers in the Study Areas have to finance their own production activities, while only about a third (39 percent) of them avail their credits from other sources. These other sources include the merchants/traders (14 percent), cooperatives (11 percent), and banks (5 percent). The survey also points out that the majority of small farmers is still rely heavily on informal sources of credit. These sources of credit include the merchant and traders who are easily accessible and do not generally require collateral or paperwork (see Table O.1-4).

An average loan of 8,717 pesos each was availed of by only about a third (217 farmers or 36 percent) of all farmers in the Study Areas. However, the size of loans vary from region to region, i.e., from 11,290 pesos in Region III and 15,250 pesos in Region XIII to very low amounts in CAR and in Region VII. While only 18 percent of these farmers feel it is necessary to avail of such financing, 23 percent thinks otherwise (see Table 3.3-13).

The survey results also indicate that, in palay production, nine percent of the respondents borrowed 5,000 pesos each or less per hectare, and three percent borrowed 10,000 pesos or less to purchase seeds and fertilizers. For those in corn production, six percent borrowed from merchants/traders to purchase seeds and fertilizers. Among the coconut producers, 2.5 percent borrowed from merchants/traders at 5,000 pesos or less per hectare. As to land loan, two percent borrowed from the bank at 10,000 pesos or more per hectare. To finance household expenses, one each borrowed from either the merchants, relatives or neighbors at an average amount of 5,000 pesos or less per hectare. The same amount is borrowed for education, although the majority borrowed less.

Of all the borrowers, 32 percent still have to settle various debts (crops, machinery, land, household, education, groceries, medicines, business capital) incurred by them. Only ten percent of the loan principal remain in arrears. The average interest charged is six percent per annum.

### 3.3.9 Demand and Supply of Agricultural Products

Data on the minimum daily food requirement per person (among Filipinos) are not readily available. The data contained herein are based on the per capita consumption (culled from household expenditures) multiplied by household population. It is surprising to note that all these Study Areas are net importers on their staple food. Table O.1-6 shows that the Study Areas are incapable to meet the minimum palay requirement of its community members. Results of the survey reveal that the Study Areas are also net importers of rice and vegetables.

As to the consumption demand for meat, two out of 12 Study Areas are net importers of meat and its products. All Study Areas are net importers of their fishrequirements. While excess demand for fish is understandable, that for vegetables require more investigations into its peculiar nature.

Based on the above, the key factors leading to the excess demand for several food items of the people in the Study Areas may be summarized as low soil fertility, lack of know-how on appropriate technology, low education, insufficient water supply or no irrigation facilities at all, and lack of capital.

## 3.4 Irrigation Water Resources

### 3.4.1 Available Water Resources

As mentioned in the previous paragraph, since almost all the Study Areas are hilly and rolling in topography with land slope less than 18 percent in general, most water sources for irrigation purposes are generally very scarce and are located in lower elevation in the area.

Water sources are generally rivers, creeks, springs, and wells. In the Study Areas, some types of water sources mentioned above are available. However, most of these water sources are dried up during the dry season, except the creek discharges which is used for paddy rice field irrigation at Talugtog (Region-I), Cofcaville (Region-II), Pagasa (Region-V), and Kipalili (Region-XI). The water sources in these areas are presently diverted by simple brush dams and small structures constructed by beneficiaries, and conveyed to the field through canals with gravity flow. Their discharges are estimated at about 0.2 to 0.3 cu.m/sec.

### 3.4.2 Potential Water Resources

In addition to the present water sources used for paddy field irrigation mentioned above, the following three sources could also be considered as potential water sources, that is, creek discharge in Abiera Estate (Region-VI), river discharge situated around Marangog ARC (Region-VIII) and creek discharge in Silae ARC (Region-X).

The creek discharge in Abiera Estate is not abundant, but could be used by pumping up to the relatively high lands. The river around Marangog ARC, which is located outside the Study Area, has sufficient discharge to supply water as irrigation water sources in the area. The water will be conveyed to the area by means of small scale canal or polyethylene pipe, and distributed applying tank irrigation method used presently in undulation areas in the other ARC areas. The discharges in Silae creek has a potential to irrigate existing low-lying paddy field by providing small-scale diversion dam in the creek.

## 3.5 Agricultural Infrastructure Conditions

### 3.5.1 Irrigation Conditions

In general, present irrigation practice in the marginal areas are minimal and simple systems.

Among 12 marginal areas, irrigation has been practiced only for paddy at seven areas at very small scale, from a few hectares to a maximum of 12 ha due to scarce available water and limited land suitable for paddy. Irrigation can take place only at the areas where (i) water can be taken easily for irrigation by gravity from the creeks or springs and (ii) the farm land is topographically suitable for irrigated paddy.

Irrigation system is simple, where in most cases, water is led to the farm lots directly from the creeks/earth ditches by opening the bank or from the springs by providing small waterway.

Irrigation facilities are found in four Study Areas, namely Sappaac ARC (CAR), Talugtog ARC (Region-I) Silae ARC (Region-X) and Kipalili ARC (Region-XI) among seven Study Areas where irrigation practices are been undertaken. Major irrigation facilities are water impounding dams (Sappaac ARC), farmpond (Silae ARC), temporary intake weirs (Kipalili ARC), open dug wells (Talugtog ARC) and earth ditches. Polyethylene pipes are sometimes used to convey water from the springs/dams/wells to the paddy field due to absence of canals. These facilities have been built and maintained by farmers themselves, and their conditions are totally poor and weak (refer to Table M. 1-2).

### 3.5.2 Drainage Conditions

Generally, drainage is not serious problem in the marginal areas as topography of the areas is mostly rolling, sloping and/or mountainous, except in some areas where lowlands are seen partly along creeks. Floods have occurred at Maulawin ARC (Region-IV), San Vicente ARC (Region-VII), Silae ARC (Region-X) and Kipalili ARC (Region-XI). In case of Silae ARC, schistosomiasis occurs at the lowland paddy area due to absence of drainage system.

Particular drainage facilities are not been found in the 12 Study Areas. Small drainage ditches can only be seen in areas where irrigation for paddy is practiced (refer to Table M.1-2).

### 3.5.3 Farm Land Conditions

Farm lands for upland crops, such as, corn, root crops, bananas, coconut, grasslands and other trees are grown mostly at naturally sloped land. No farm land consolidation has been observed. These farm lands, especially cogonal grassland where slash-and-burn farming is practiced, would easily be eroded when rain comes as observed in some Study Areas. On the other hand, the lands for rainfed and irrigated paddy are mostly the terraced flat field. Each farm lot of paddy is small in size being maintained by farmers themselves (refer to Table M.1-2).

### 3.5.4 Farm Road Conditions

Farm roads which connect between farms and households/barangay are not available in almost all of the Study Areas. There are only footpaths or trails in the farming areas, therefore access road or farm-to-market road from the main road to barangay also function as a farm road (refer to Table M.1-2).

## 3.6 Rural and Social Infrastructure Conditions

### 3.6.1 Settlement Conditions

According to the field survey for the whole Study Area, it was revealed that settlement conditions of the beneficiary farmers are classified into two types. Namely, lands where beneficiary farmers settle in the distributed land, and the other, are lands without farmers settling within the Study Area.

The former is the normal settlement conditions in such ARCs as Montilla, Silae and Mat-i, where most of the beneficiary farmers do not stay within the land. The farmers undertake farm activities in the marginal land during daytime and go back to their residence, usually at the barangay proper/sitio during night time and/or after farm activities are completed. In these areas, the required minimum settlement conditions such as access and rural roads, rural water supply, etc. are not properly provided.

### 3.6.2 Rural Roads

Access roads from the national or main road to the marginal areas are classified into three categories, i.e. provincial road, municipal/city road and barangay road. Provincial and municipal/city roads are normally in a range from the national road or municipal/city center to the large barangay, and barangay road is from the large barangay to the small barangay/sitios in study area.

Among 12 Study Areas, Abiera Estate (Region-VI) and Mat-i ARC (Region-XIII), have no complete access road. In this case, farmers have to walk on the footpaths/trails to reach their households/barangays from the end of the existing access road. Even in the other ten Study Areas, the access road are available from only one place and/or main road.

Conditions of the rural roads, particularly barangay roads which are mostly earth/dirt road, are obviously in poor condition due to frequent typhoon damages and lack of maintenance/rehabilitation works. During the wet season or even in the dry season when it rains, many sections of the barangay roads become impassable and dangerous for motor vehicles. Due to such severe road condition, transport system in the marginal areas are also nearly absent or negligible. The number of expected passengers from /to the Study Areas are very minimal.

Roads and bridges are public infrastructure to be maintained by the government. There are three local government units (LGUs) which undertake operation and maintenance of roads, i.e. provincial government for provincial roads, municipal/city government for municipal/city roads and barangay unit for barangay roads. However, the barangay unit is relatively small to conduct proper road maintenance. Therefore, the barangay unit would usually request the provincial or municipal/city governments assistance, particularly for road

maintenance equipment. Usually, the barangay shoulder the cost for fuel and lubricant, and at times also the wages of equipment operators. If such equipment is not available at the motor pool of the provincial or municipal/city government, the barangay would go to the DPWH District Office which normally has bigger motor pool than the LGUs (refer to Table M. 1-2).

### 3.6.3 Rural Water Supply

Water for domestic use in the marginal areas are generally taken from wells or springs. Among 12 Study Areas, wells are used at eight areas and springs at three areas. One area, Mat-i ARC (Region-XIII), has no existing domestic water source because of absence of households in the marginal area. The number of wells or springs seems to be insufficient at several marginal areas. Water treatment facilities are not seen in any of the marginal areas (refer to Table M.1-2).

Wells, mostly public common wells with level-I system are generally classified into three categories, i.e., deep well, shallow well and shallow open well (dug well). Water from the deep and shallow wells are brought up by a hand pump, and from the dug well simply by a bucket. A deep well with a motor pump is found at Cofcaville ARC (Region-II). Many privately-owned shallow and dug wells are also observed in some of the Study Areas. Most of deep, shallow and dug wells are capable of supplying water throughout the year.

Conditions of spring supply are generally poor. The volume of spring water are unsteady depending on the season. Barangay-owned level-II system are found at Sappaac ARC (Region CAR) and Marangog ARC (Region-VIII). However, the system in Marangog is not properly functioning due to leakage at pipe connections. Privately-owned level-II system from the limited spring water source is seen at Montilla ARC (Region-III). At Abiera Estate (Region-VI), undeveloped small open springs are found used only for domestic use. At sitio-1 of Talugtog ARC (Region-I) spring water is used only for washing purposes and would usually be dried up during the dry season. Potable water for the whole area of sitio-1 is taken from the only deep well located at the center of the sitio.

Operation and maintenance of the hand pumps of common wells, communal faucets from the springs and springs source itself are undertaken by users of the community.

### 3.6.4 Rural Electrification

Electric power is usually supplied by the local electric cooperatives. Among 12 Study Areas, Montilla ARC (Region-III), Abiera Estate (Region-VI), Marangog ARC (Region-VIII), part of Silae ARC (Region-X), and Kipalili ARC (Region-XI), have no electric powers. They use kerosene lamp. Consumption cost is around P30 to P65 per month. The distance to the nearest existing power lines are between 1.0

km and 4.0 km. In Mat-i ARC (Region-XIII) where beneficiary farmers live outside the marginal area, electric power is not available.

The other six Study Areas have electric power with 24 hours supply a day. However, several households have no power line connected to their houses, mainly due to high power rate (refer to Table M.1-2).

Operation and maintenance are undertaken by each local electric supply cooperatives. The power line, both transmission and distribution lines are often cut off by strong winds and heavy rains.

### 3.6.5 Other Facilities

The social facilities and services are usually concentrated in one cluster at the center of the barangay proper. All the ARC Areas have day care centers and have elementary schools which are located at the center of the barangay. However, access to these facilities by the marginal farmers are limited severely by poor roads. In most instances, the farmers' residence are located far from the school, hence, the non-interest to continue schooling. Completion rate is very low as attested by the fact that only a very few percentage complete elementary (about 20 percent) or secondary education (10 percent). Also, many of the schools have limited rooms and the multi-grade system is practiced hampering the opportunity of the school children to learn more. Talugtog has no elementary school and the school children go to the next barangay, in Baroro, for schooling. At San Vicente ARC Area, only grades one and two are available. Secondary schools are available only in Maulawin, Silae and Mat-i ARCs (Table I.1-9).

Barangay health centers are available in most of the Study Areas, except Talugtog, Marangog and Kipalili. These health centers have none or very minimal materials and supplies even for emergency purposes. Health personnel such as midwife, barangay health workers, nurses are not available on a regular basis. Activities at the health center are done on a weekly basis or on a per project basis as day for immunization, vaccination, some family planning activities, which are not very often. The health clinics are therefore closed most of the time and are not being used. 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.

Almost all areas have barangay center/hall, and in some areas, even an auditorium, where barangay activities are usually held, such as meetings, social gatherings, barangay fiesta activities, etc. Only Silae has a barangay public market which was still under construction during the time of the field survey investigations.

## 3.7 Farmers' Organization and Its Activities

### 3.7.1 Farmers' Cooperatives

Farmers' Cooperatives are the most popular farmers' organization which has been established after 1990 in all the Study Areas. The membership covers 13 percent to 87 percent of the farmers in the areas with an average of 50 percent. The activities cover multi-areas, such as, management of consumer store, auto-saving, agricultural credit, group marketing of farm products, group buying of farm inputs, propagation of fruit seedlings, breeding of swine/cattle/carabao, availment of farm technology and collective use of farm machinery. Major sources of funds are capital share, loan from CBU and LGU, and consumer store income, etc. Due to lack of capital and delayed return, credit activities has been suspended in most of the cooperatives (Tables H.1-9 to H.1-13).

### 3.7.2 Water User's Association

Mat-i, Region XIII is the only area with irrigation association among the 12 Study Areas. In the area, there are two irrigation associations: Pusan-Mat-i Irrigation Association established in 1992 and Cagpangi Irrigation Association established in 1993. About 35 percent of the interviewed farmers are members of the associations (Table H.1-10 and H.1-12).

### 3.7.3 Other People's Organizations

There are 28 People's Organizations besides the above two organizations as shown in Table H.1-11. The activities cover religious, women's, natural environment protection, PTA activities, etc.

## 3.8 Rural Agro-Industry

### 3.8.1 Present Agro-Industry

In the Study Areas, agro-industry materials are also planted, such as abaca at Abiera in Region VI. In this area, there are farmers who make mats, baskets, hats, etc., as cottage industry, though not on a large scale.

The Philippine National Development Plan has been promoting the development of agro-industry since 1993. The Department of Trade and Industry (DTI) has been conducting agro-industry promotion programs nationwide as well as in ARC areas of Comprehensive Agrarian Reform Program (CARP) in cooperation with the Department of Agrarian Reform (DAR). Unfortunately, these development implementations has not yet been conducted in the Study Areas. Agro-industry development implemented by DTI and DAR are as follows:

- Coffee Processing Plant in Las Nieves, Agusan del Norte
- Citronella Plantation in Tuburan ,Cebu,
- Home Made Meat Processing in Capiz,
- Mango Processing Plant with Private Enterprise in Agusan del Norte,
- Cut Flower (Orchid) in Davao and Nasipit, Agusan del Norte,
- Copra Processing with loan,
- Wooden Furniture Making in Paracelis, Mountain Province,
- Bamboo and Rattan Furniture Making in Region-XI,
- Loom Weaving & Processing in Agusan del Norte and Camarines Sur,
- Hand Made Paper in Lagawe, Ifugao,
- Coco Charcoal Making in Samar,
- Pottery & Brickmaking in Antique, Iloilo and Maguindanao.

DTI has carried out the above projects focusing on manager training, product development for marketing, bulk buying of product and processing equipment services. But, since the budget have become limited, DTI is now concentrating only on three major projects for CARP beneficiaries such as the agro-industry nucleus estate project aimed at contract farming, development of people's industrial enterprises being sub-project of the Canadian International Development Agency-Entrepreneur Support Project (CIDA-ESP) and Craft Village Development Program. Selection system of these projects conducted by DTI consists of four steps, complete CARP activity, group stable to business enterprise, gradual training and investor seeking.

There are other projects for agro-industry development funded by the DAR and DA, and these are the CARP-Barangay Marketing Center (CBMC) and the Farm Level Grains Center I (FLGC-1), which has been implemented aimed at the primary farmer cooperatives to acquire the capability to achieve maximum returns for their harvest. This program consist of financing for marketing of grains and construction of on-farm warehouse with solar dryer and rice mill and financing for the purchase of mechanical dryers for at least 300 cooperatives across the country.

Since some of Study Areas are planting the aforementioned promotional crops, there are chances of introducing such kind of equipment, facilities and technologies, provided farmer cooperatives are well organized and are willing and that there are sufficient volume of materials to be processed.

Kalahan Education Foundation Inc., which was established in 1973 in Imugan, Nueva Vizcaya, Region II, with the assistance of pastor Rev. Delvert Rice, have been conducting agro-industry training as a series of technology transfer to the students. It has also food processing activities making juice, jam and jelly from native guava, orange, atsuete, calamansi, lemon, black berry, daguay, etc. Processing facilities are small, such as, a few cauldrons to boil the fruits, oven, crusher, scale, bowls, conveyer for bottling, labeling tools, cabinets, tables, and two rooms, one for processing and another for stock room. Size of these rooms are four meters by eight meters. This Foundation is also promoting cut flower processing and extend its technology to the adjacent cooperatives.

The Baptist Rural Center (RLC) in Bansalan, Davao del Sur, Region XI is promoting the Sloping Agriculture Land Technology (SALT). In the series of SALT, some agro-industry technology have been transferred to the students, which is raising of cattle or goat inside the agro-forest lands and processing raw milk to drinking milk or milk candies for marketing. SALT technologies have been introduced to some DAR staff in the near regions, as well as transferred to selected farmers in ARC including marginal areas as demonstration, but has not yet been adopted.

### 3.8.2 Potential Agro-Industry

Agricultural production quantity and variety in the Study Areas are limited. These are important in the introduction and development of agro-industry. Key points to consider are the availability of quality raw materials which can be obtained on a regular basis, the materials can be readily transferred to the nearest market place, more consumers can avail of the materials and the product/materials are acceptable and suitable to the consumers. The raw materials in the Study Areas which has the possibility to be developed are palay, corn, banana, mango and coconut. Recently, coffee and cacao has been promoted in the Mindanao provinces.

Agro-industry facilities and technology to be prepared at the initial stage of the Project at the Study Areas should not be the sophisticated and complex. Agro-industry equipment and facilities expected to be provided at the initial stage are harvesting machine, drying facilities, rice mill and corn mill. Collection and grading warehouse will be considered for banana and mango. For coconut, expected facilities are marketing warehouse, processing and drying facilities. Coffee and cacao will need drying facilities. Moreover, if the cooperatives will be well organized and will venture into collective economic activity, it is expected that

even the private entrepreneur may join the cooperatives and invest in the more sophisticated processing activities to obtain higher returns.

At present, agro-processing firm on banana exists in Panabo, Davao, Region XI and produces banana chips for dessert for domestic and foreign markets. Some private company intends to produce coffee on the bases of contract farming.

Thus, even in the Study Areas, there are possibilities of introducing and developing primary agro-industry. Furthermore, in the future, when the CARP activity is more firmly conducted, cooperatives are better organized, and have more keen intentions of venturing into collective economic activity, it is expected that the agro- processing facilities promoted by DAR, DA and DTI can be easily introduced as well as private entrepreneur can participate and invest.

## 3.9 Rural Environment and Public Health

Balanced ecosystem and sound public health conditions of the ARCs are some of the major concerns in the environmental security for sustainable development of the ARCs in the marginal areas. The anthrophogenic disturbances of landscapes of these communities contributed to the degradation of the soil, water and the public health. Rehabilitation and conservation of the disturbed landscape elements and protection of the remaining endangered patches need assessment of the critical environmental attributes for management to enhance the livelihood production systems, protection of the community infrastructure while improving the environment and public health of the agrarian reformbeneficiaries.

### 3.9.1 Soil Erosion

Most of the Study Areas have rolling to hilly landscape except Talugtog ARC and are prone to severe soil erosion (Table P.1-1).

At least 30 percent of the area of the seven ARCs are hilly. The hilly areas are predominantly covered with cogon which is subjected to grassland fire during the dry season. Burned cogonal area has higher crop cover coefficient of the estimated soil loss (0.4) than the unburned, well established ones (0.007). The upland annual crops are grown on the rolling areas with up and down slope cultivation and without any soil conservation practices. Shifting cultivation are still being practiced on the sloping areas of the hilly lands. The stream corridors are cleared and planted to annual crops like corn and non-creeping annual crops.

In Kipalili ARC, the shrubs in the gullies are cleared and planted to corn and other root crops. The former gullies are very distinct even though with thick cogon in San Vicente ARC. The cultivated land lacks ground cover particularly with non-creeping crops during the growing period in the rainy season which is more often accompanied with several typhoons except in Region-X and XI. The rainfall erosivity is very high at Cofcaville, Pag-asa, and Mat-i ARCs. The occurrence of typhoon hazard aggravates soil erosion (Table P.1-2). Even though the soils have moderate soil erodibility, the slope, rainfall erosivity and crop factor increase the potential soil erosion. Mat-i ARC is an earthquake prone area which poses high risk to human activities. Land creep or mass movement could occur on the steeply sloping areas after an earthquake. The reduction in topsoil depth suggests the negative effect of soil erosion overtime. Consequently, the soil fertility and land productivity declined. The off-site effects of soil erosion are the siltation of the channel of the creek, the drainage system, or the diversion dam for irrigation of paddy rice on the alluvial pan, occurrence of flooding, and damage to the earthen barangay road like in Kipalili ARC. Flood also damaged the rice crop in Maulawin, Pag-asa, Abiera Estate, and San Vicente ARCs and the corn crop in Cofcaville and Silae ARCs. The alluvial pan and footslope is being terraced for rainfed lowland rice. It also serves as the sediment trap for the transported soil particles from the upper slopes.

### 3.9.2 Water Quality

Farmer respondents from Sappaac, Talugtog, and Maulawin ARCs indicated that water pollution did not occur in their communities. However, shallow wells and inadequately maintained spring which are susceptible to pollution are also the sources of the drinking water in the areas. The key informant in Marangog ARC indicated that the leaking plastic and bamboo pipes from the spring are the source of pollution of the drinking water. In San Vicente ARC, the shallow wells are contaminated with runoff water during the rainy season. In Kipalili ARC, water pollution of the drinking water occurred. The occurrence of water borne diseases which are associated with improper disposal of human waste and the presence of household without toilets strongly suggests that water pollution of the drinking water occurs. Eight respondents in Abiera Estate and one respondent in Pagasa indicated that improper use of pesticide is one of the causes of water pollution of the surface water (Table P.1-3)

The Taboc River at the boundary of the Talugtog ARC is affected by salt water intrusion. It can not be used for irrigation of crops. Other Study Areas are not affected by salt water intrusion. The salinity of the irrigation water from the shallow wells must be checked for any salt water intrusion.

### 3.9.3 Flora and Fauna

The occurrence of extensive cogonal areas in marginal areas of the Kipalili, Silae, San Vicente, Maulawin, Cofcaville, and Abiera Estate ARCs indicate severe ecological disturbance of their landscapes. San Vicente ARC was part of the pasture of the Bohol Cattle Corporation. Cogon dominates the grassland ecosystem when the soil fertility becomes very poor and it can outcompete other grasses with the frequent grassland fire. Grass and shrubs are growing luxuriantly between the coconut trees in Mat-i ARC and hilly areas of Abiera Estate ARC.

The farmers in the 12 Study Areas are still maintaining native varieties of lowland and upland palay, corn, vegetables, legume, root crops, fruit trees, coconut and coffee. In San Vicente, Marangog, and Kipalili ARCs corn is planted for food. Abaca is grown in Marangog, Abiera and Pag-asa ARCs. Rubber is grown in Abiera Estate ARC. Black pepper is grown at Montilla ARC. Most of these native varieties are tolerant to the soil problems but their yields are low.

Kipalili, Pag-asa, Silae and Cofcaville ARCs are former logged over areas. Shrubs and few remnant trees are present along the intermittent creeks in Kipalili ARC. Some farmers in Kipalili ARC planted gmelina in their farms with the assistance of the cooperative in 1992. They are already harvesting gmelina trees with 30 cm diameter for lumber. Minor forest species like bamboo, tikog, and tibaw are under utilized in Mat-i ARC. Patches of shrubs and remnant secondary forest trees are present on the hilly areas in Sappaac ARC. Montilla and San Vicente ARCs do not have any large patches of forest trees. Gmelina, mahogany,

narra, and ipil-ipil are the most preferred agroforest species by the farmers in the 12 ARCs. Very few preferred bamboo, kamagong, paper tree, and yakal. Unlike in other ARCs, less than 30 percent of the farmer respondents in Sappaac, Talugtog, Cofcaville, Montilla, Silae, and Maulawin ARCs are interested to learn firewood production. Only respondents at Montilla, Cofcaville, and Maulawin ARCs are both less willing to participate in firewood and charcoal production and they have low level of the needed skills. The respondents in Sappaac, Talugtog, Abiera, San Vicente, Marangog, Silae, Kipalili, and Mat-i ARCs are both willing to be engaged in bamboo timber and shoot production. Montilla and Cofcaville ARCs have low interest in bamboo timber and shoot production. However, Pag-asa and Maulawin ARCs are interested only in bamboo timber production. The respondents in Abiera Estate, Pag-asa, Kipalili, and Silae ARCs indicated that they have the skills in bamboo timber production. All the ARCs have low skill in bamboo shoot production except in Abiera Estate ARC.

Carabao, pig, chicken, and cattle are raised in all the ARCs except Kipalili ARC where cattle are not available. Native breed of pigs are raised in the ARCs. Pag-asa ARC does not raise goat. Ducks are raised in Abiera Estate, San Vicente, and Kipalili ARC. Geese and turkey are raised only in Cofcaville ARC. The communities catch tilapia from the rivers and creeks around the ARC. No endangered animals are reported in the Study Areas. In Pagasa ARC, the beneficiaries catch wild pig from the forest area at the footslope of Mt. Isarog.

### 3.9.4 Public Health

The number of overweight children is relatively low compared to the number of normal children in all ARCs with available data. All ARCs have low level of third degree malnutrition except, Sappaac and Pag-asa ARCs. The number of first and second degree malnourished children in San Vicente ARC is very high. In the municipality of Calauag, Quezon, the opposite occurs. This suggests the marginality of the areas to provide adequate and balanced nutrition.

The children of Sappaac, Talugtog, Cofcaville, Maulawin, and Kipalili ARCs have been provided with vaccine for tuberculosis, diphtheria, pertusis, tetanus, polio, measles and hepatitis. However, vaccine for diphtheria, pertusis, tetanus, and polio was not provided to the children of Montilla and San Vicente ARCs, but this was provided to other barangays of the same municipality. In the case of Marangog and Mat-i ARCs, only the vaccine for measles and hepatitis was not provided. The whole municipality of Malaybalay did not get the vaccine for hepatitis. The Pagasa and Abiera Estate ARCs did not have any information on the immunization of the children. Absence or incomplete immunization of the children to these diseases that affect most of the children would predispose them to serious health problems.

The use of pill, condom, and intra-urinary device are the commonly offered family planning services by the local health office. Tubal ligation is offered by the

health office in Bangued, Abra and Trinidad, Bohol. Vasectomy, use of DEPO/PMDA, sterilization, and natural rhythm are provided by other health offices to ARC. The use of pill, condom, DEPO/DPMA, IUD, and/or natural rhythm are commonly accepted. Family planning program must be sustained in order not to exceed the carrying capacity of the marginal areas.

Diseases of the respiratory and digestive systems commonly occur in the marginal areas. 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 at the national level. The poor disposal of human waste and the polluted drinking water from shallow wells, springs and/or rivers are the contributing factors among others to the occurrence of diarrhea, gastroenteritis, amoebiasis, dysentery, and typhoid fever. Malaria occurs in Cofcaville and Kipalili ARCs. Schistosomiasis occurs in Silae ARC. The causes of morbidity in the barangay of the ARC are not always the same in the entire municipality.

Similar leading diseases together with skin diseases and bronchitis affect the children. Schistosomiasis also affects the children in Silae. Dengue fever like malaria is transmitted by mosquitoes. Malaria affects the children in Kipalili ARC.

Improving the diversity of food crops in the home garden that will provide the nutritional needs that would enhance the resistance to the diseases is needed. Planting of medicinal plants should be encouraged to have a readily available source when the common disease occurs at the household. Malaria control program should be implemented immediately by the local health office in Asuncion, Davao del Norte and in Madella, Quirino. Schistosomiasis control program should also be implemented in Silae ARC. Preventive public health management should also be enhanced together with environmental awareness.

Annual expenditure for medical services is very low (P320 - P2585) in the Study Areas. This is equivalent to one to seven percent of the annual expenditure of the household. Preventive health management, provision of clean and safe drinking water, and proper disposal of human, animal and domestic waste would at least maintain, if not reduce the medical expenses of the household.

Tuberculosis, severe pneumonia, and diseases of the heart (cardiovascular disease and myocardial infection) are the leading causes of mortality in the nine ARCs, except in Talugtog, Cofcaville, and Maulawin ARCs which had no available information on the causes of mortality. These diseases are part of the leading causes of mortality (National Statistical Coordinator Board, 1995). In the case of the children, severe pneumonia, congenital anomalies, disease of pulmonary circulation, measles, and pre-maturity are the major causes of mortality among children of five years old or younger. The same diseases affect the children at the national level. Improvement of the environment and health conditions of the agrarian beneficiaries must be sustained while improving the productivity of the livelihood production systems.

## 3.10 Problems, Constraints and Development Potentials

### 3.10.1 Present Major Problems and Constraints

Prevailing major problems and constraints encountered in the Study Area are summarized below:

1) Physical Conditions

- Topography of the Study Areas is rolling and sloping. Elevation of the areas varies from 40 m to more than 600 m above mean sea level,
- The gradient of areas should basically be the range from five to less than 18 percent. However, some areas are located in topography with a steep slope of more than 18 percent, and
- Access to some areas such as Pagasa and Mat-i ARCs are very difficult due to non-maintenance and absence of adequate access roads.

2) Agriculture

- The average farm size of sample farm household is relatively small, at 1.77 ha per farm household, including about 1.01 ha of idle land per farm household,
- Cropping intensity in the Study Areas is low, at 28 to 92 percent with an average of 58 percent. The total area including idle land is counted as 129 percent,
- The marginal land includes steep land and the rolling and hilly topography hampers intensive land-use,
- Soil fertility of the marginal areas is relatively low to normally low, and needs proper soil management including remedy of soil acidity,
- Some stony and gravely soils are found, which are accompanied with severe soil erosion,
- The unit yield of the respective major crops are considerably lower than the national average, except for the yield of yellow corn,
- Crop damage by typhoon is very severe, particularly in the Bicol, Eastern Visayas and Northern Mindanao areas, and
- The extensive and traditional farming practices with low-level of farm input prevail in the Study Areas.

3) Agricultural and Rural Infrastructures

- Lack of irrigation facilities under limited water sources, absence of farm roads, and poor conditions of rural roads as farm-to-market roads,

- Absence or poor conditions of the access roads, insufficient number of rural water supply facilities and non-supply of electric power in some areas,

- Lack of health services, medical personnel and medicines, and

- Lack of classroom, school materials and supplies, such as chairs, books, materials, simple equipment for science and other subjects.

4) Agro-Economy

- Farm-gate price is very low, as cited and complained about by most farmers. In addition, there exist the problem on transportation, market information and inaccessibility to market,

- The access to farm credit is limited and at very low borrowing level,

- Marketing and crop prices are heavily controlled by local traders,

- Rural transportation remains too weak, hence, remote places are difficult to access, and

- Government extension services are not sufficient, e.g., technical support, agricultural information and training.

5) Animal Husbandry and Fisheries

There are a number of important constraints to livestock development. These constraints tend to be consistent throughout the marginal areas of the country, although there are some differences in emphasis among areas.

Lack of Carabao and Cattle

The domestic cattle population is inadequate to meet local needs. Genetic resources need to be reviewed. The carabao offers a tremendous opportunity to the rural marginal population. There is a relatively large population of carabao dispersed across a large portion of the population. Because of the nature of the carabao and their uniformly small size, this requires special consideration if it will continue to be a major resource into the year 2000. The carabao can be viewed as a national resource to be improved, enhanced, and utilized.

Poor Quality of Domestic Cattle and Carabao

Carabaos are at best shy breeders and difficult to involve in an Artificial Insemination (AI) program. The newly established Philippine Carabao Center (PCC) can be better served by focusing on the nature of the carabao herd.

With the exception of the government owned livestock farms and private commercial farms, the majority of native animals have been inbred and generally allowed to deteriorate genetically. The nature of the carabao, Heat Synchronization may be the key to breed improvement. It is likely that modification of current techniques used in cattle will be effective. This has been documented, but utilizing various methods could be done quickly. Also, the night corralling technology is recommended for carabao production in the Study Areas.

Lack of Water Facilities for Livestock Production

Water is essential is feed, thus, it must be made available at all times. On the average, a mature cattle and carabao consumes about 45 liters of water per day. The consumption varies with the size of the animals, season, and type of breed. Most of the upland farmers have scarce drinking water for livestock particularly during the dry season. Some sheep and goats are very tolerant to partial dehydration. Bos indicus breeds (local breed) requires less water than Bos taurus breeds (mainly exotic breeds). But carabaos and pigs are relatively intolerant of water deprivation. All herded or housed animals in the study areas must have access to free water, preferably throughout the 24 hours. The swamp carabao apparently is not as adaptable as the river carabao. Swamp carabaos must have almost unlimited access to water to keep them cool. However, if kept in the shade, and rested or put to work at a slow pace unexposed to the sun during the hot weather their tolerance to heat is of no mean order.

Lack of Capital

Lack of capital is the major problem of the farmers in the Study Areas. They don't have enough money to buy working animals. Interested farmers may avail of the Multi-Livestock Dispersal Loan Program (MLDP) currently implemented by the BAI. However, current interest rates make it difficult for marginal land farmers to buy or to introduce new and improved cattle or carabao that require capital investment. It offers an interest rate of 10 percent with eight years amortization period on the principal.

Technology

Return of cow-calf operation has historically not been at high enough levels to encourage innovation or adoption of higher technology. The rate of technology adoption is improving, particularly among marginal area farmers in Mindanao and Visayas, although the pace of change tends to be slower in much of Luzon. One

inhibiting factor to such adoption, however, is the difficulties experienced by Philippine farmers in accessing new technology.

General Infrastructure Inadequacies

Farm to market roads in most of the Study Areas are inadequate or nonexistent.

Lack of Support Services Infrastructure

Regional Animal Disease Diagnostic Laboratories (RADDL) outside Metro Manila are mostly non-functional. Also, generally lacking are good regional animal disease diagnostic laboratories. AI services are inadequate and generally inefficient. The government's veterinary and extension services for farm animals are inadequate for lack of facilities, trained personnel, funds, etc.

Poor Feedstuff Utilization and Formulation

The marginal areas have an abundance of feedstuff suitable for ruminants, but these are not being efficiently utilized. The general tendency, particularly among backyard farmers is to feed whatever is cheap or popular without attempting to provide balanced rations.

6) Agro-Industry

Post-Harvest

- Physical Aspect
  - Limited lands to produce agricultural crops,
  - Limited harvesting varieties and amount due to steep and rolling topography,
  - Absence of roads or poor road conditions for hauling agricultural inputs, materials and products, and
  - Lack of farmers' capital to purchase good quality seeds, chemicals and materials.

- Marketing Aspects
  - Lack of quality control to obtain better quality and returns,
  - Absence of quality control systems or standards by institutional administration,
  - Low and different prices of crops depending on quality and season, and
  - Low selling prices, because the marketing routes have not been properly established.

Rural Agro-Industry

- Physical Aspects
  - Limited harvesting varieties and amount,
  - Difficulty to obtain better quality products at more reasonable prices and stable situation, due to severe and poor physical conditions,
  - Most of the Study Areas are located far from consuming and marketing places, and
  - Difficulty to transport the input and products, due to poor road condition.

- Operation and Maintenance Aspects
  - Adequate and effective cooperatives have not yet been firmly organized,
  - Cooperatives' intention to agro-industry have not yet been settled,
  - Few farmers have a experience in agro-industry,
  - Farmers have no technology on agro-industry, and
  - Limited chances for farmers to undergo consecutive training on agro-industrial technology.

7) Marketing of Crops

- Difficulty in marketing activities of agricultural products due to lack of access roads,
- Lack of information on crop prices,
- No control of market of local traders resulting to low prices, price control and unstable price, and
- None and/or limited access to group selling/marketing of farm products.

8) Environment

- High soil erosion, pollution of drinking water sources, none to low forest cover of the watershed, in which there are the source of irrigation and domestic water, the stream corridors, and steep and hilly areas; occurrence of malaria and Schistosomiasis in Cofcaville and Silae ARC, respectively, inappropriate farming systems, genetic resources banishment of forest tree native species, improper disposal of human and animal waste, improper use of pesticide, occurrence of water borne diseases, and inadequate environmental awareness and knowledge on primary health care,

- The occurrence of typhoon hazard destroying the farmland and property of the communities, particularly in Pag-asa, Cofcaville, Marangog, Maulawin and Mat-i ARCs,

- In spite of the security of tenure of agrarian reform beneficiaries, rehabilitation and conservation of the farmlands and the stream corridors of the ARC are inadequate, and

- The local land-use zoning ordinance commonly does not have any sanction on the exploitable use of the land and water resources in the agrarian reform community. If the anthrophogenic disturbances of the ARC marginal landscape could not be corrected immediately, the agrarian reform beneficiaries would move to other ecosystems for their subsistence. This would farther aggravate the social and ecological problems.

### 3.10.2 Development Potentials

To alleviate the prevailing situations mentioned above, project plan should be established with the following development potentials:

1) Agriculture

- Since the minimum amount of irrigation water sources will only be used for rice, fruit and timber tree nursery station, intensive cultivation of paddy rice in the wet season and diversified crops in the dry season on a small-scale could be employed. Fruits and other perennial crops and timber trees could be planted in relatively larger areas, where minimum water sources are available for the initial growth of crops and trees,

- In the gently sloping upland areas, crop cultivation could be intensified through the development of farm roads, improved soil management, and development of drainage conditions in the low-lying depressed land,

- The fast growing timber trees such as gmelina and acacia, ordinal timber trees, such as, mahogany, narra and bamboo could be grown in the land not suitable for crop cultivation. In steep areas in marginal areas, the plantation of these plants/crops could be increased, and

- The introduction of Sloping Agricultural Land Technology (SALT) and agro-forestry will be required in lands with slopes of more than 18 percent.

2) Agricultural and Rural Infrastructures

- Unused water source in small rivers, creeks and spring could be utilized for irrigation purposes by providing small-scale irrigation facilities, as diversion dam, small water impounding dams, etc. Farm-to-market

roads will be essential to support and encourage agricultural activities, and,

- One of the best potentials for the Study Areas is the people themselves. The provision of rural infrastructure such as adequate education and health facilities, which are accessible will increase the labor productivity, the principal asset of the poor and therefore the income earned by them. An increase investment on health and education, particularly in the Study Area, will help improve living conditions, and serves as instrument to promote equity.

3) Agro-Economy

- In some regions, income opportunities in non-farm sector exist, and the revenue are relatively at high level, therefore, such income opportunities would be continuously encouraged and be supported,

- Crop diversification, particularly of the cash crop during the wet season will be developed with the introduction of new and appropriate technologies combined with necessary infrastructure development. Such effort could be beneficial to the rural poor farmers,

- Continuation and expansion of agricultural development, such as irrigation, rural credit and institutional development will likely magnify the effectiveness of the agrarian reform process in areas where it has been put to work,

- Simple innovative schemes to be able to organize the buying and selling farmers' products should be introduced, which could organize and encourage the farmers' cooperative or association to strengthen their participation, and

- Rural credit should be implemented to strengthen and improve the efficiency of the rural financial market. Government must support the rural credit mechanism and give an incentive to the rural farmers. Furthermore, the capacity of the rural credit market to mobilize rural savings and loan should be improved and their link with the rest of the financial system should also be strengthened.

4) Animal Husbandry and Fisheries

- A sure domestic market for livestock products,
- An increasing demand for livestock products associated with the growing human population,
- Available technologies, facilities, and other inputs for increased productivity and efficiency,

- Environment protection is becoming a serious subject for the traditional livestock production areas. However, large marginal, underutilized lands exist in the Study Areas, with considerable supply of crop residues which can be utilized as feed especially in small farms; and

- A favorable climate for crop and fodder production and the underutilizedmanpower in the rural areas.

5) Agro-Industry

Post-Harvest

- The first step for post-harvest development will be the introduction and distribution of the following equipment and facilities:
  - Harvesting machine, thresher, winnower, drying facilities, warehouse, equipment for quality control, etc. for rice cultivation,
  - Sheller, drying facilities, warehouse, equipment for quality control, etc. for corn cultivation, and other simple equipment and facilities.

- Since some areas are planting rice, corn and others, these facilities such as drying facilities or warehouse will be needed. These facilities could be utilized by all sectors.

Rural Agro-Industry

- Rice mill unit, warehouse, marketing place, etc. for rice cultivation,
- Corn mill unit, warehouse, marketing place, etc. for corn cultivation,
- Collecting and selecting facilities for banana and mango,
- Collecting, processing and drying facilities for other tree crops,and
- Others, such as, banana chip facilities; juice, jam and jelly making facilities; and wooden, bamboo and rattan furniture making facilities .

6) Marketing of Crops

- The development potential of the marginal land depends greatly on the possibility of technical improvement of the restraining factors. The solution for the low accessibility to market shall be the construction of roads which requires budgetary consideration. The biggest difficulty of the technical improvement is found in the area of rainfed agricultural potential which is totally dependent on the possibility of technical improvement. The potentiality of cogon covering slope is the next, lower to that of rainfed area, and also technical improvement is essential.

7) Environment

- Development projects in terms of environment have to focus on the rehabilitation and conservation of the life support systems; soil and water conservation, reforestation of the public land located in the stream corridors and the watershed of the sources of irrigation and domestic water, woodlot and fuelwood production, planting of medical plants, biopesticide and biofertilizer production, biogas production from the backyard pig production, construction of sanitary toilet, and environmental and public health education. This would enhance the infrastructure projects, livelihood production systems, agro-industrial processing, public health, and intergenerational distribution of the resources and environmental benefits in the communities, and

- Training on environmental planning and management for the local leaders is needed to provide them knowledge and skills on preventive environmental management including environmental impact assessment and monitoring and evaluation of the future project in the community. The on-site and off-site beneficial and non-beneficial effects of any project or policy in the ARC will fully be considered in the project planning, implementation, and monitoring and evaluation.

# CHAPTER IV. BASIC CONCEPT FOR DEVELOPMENT PROGRAM

# CHAPTER 4. BASIC CONCEPT FOR DEVELOPMENT PROGRAM

## 4.1 View of Regional Development Program

The fundamental goal of regional development is the minimization of disparities, without prejudice to the optimum realization of the region's growth potentials.

The regional development approach is therefore a deliberate effort to correct the existing imbalances which prevent the attainment of the goal of development for all.

For poverty alleviation and social justice, the opportunities and incentives for each regional community to fully utilize its resource potentials shall be provided.

Regional differences in the severity of the problems may be attributed to the unique combination of economic, social and natural factors within each region.

The regional dimensions of national problems are reflected in the following concerns;

- Persistence of poverty in the regions,
- Low productivity in the regions,
- The insurgency problem in the regions, (Regions-IX and -XII were excluded for this feasibility study due to security problems),
- The need to better utilize land and other physical resources,
- The need to promote and maintain ecological balance and environmental protection, and
- Demographic effects of uneven development.

## 4.2 Upbringing and Strengthening of Social Capacity

The ARCs in marginal areas are situated under severe poverty condition. The development of the ARCs in marginal areas basically necessitates poverty alleviation measures.

Poverty is not merely defined as a condition lacking resources and services, but as structural and functional conditions under which the capacity to procure and manage resources and services required and social system-mechanism by which the capacity is activated, are still undeveloped and untapped.

For the poor, access to resources and services can be obtained by one or a combination of, policies or administrative channels, markets and mutual

supporting activities in the community. This mutual relation is called social system in the community. The community system can be described as the inner system, while the communal administration system and marketing system as the outer system.

Development and strengthening of social capacity is composed of preparation and reinforcement of adequate mechanism of offering resources and services to the people, and improvement and upgrading of communities capacity to apply, manage and operate to attain development target.

For the development and strengthening of the social capacity at the community level, there are procedures/approaches which would emanate from traditional mechanism formed inside the community and also from outside forces.

The vital factor in the development and strengthening of the social capacity from outside the community are the so called "Participatory Approach". This means that the community will have to learn and acquire the necessary technique, knowledge, attitude, etc. required to operate and manage development results through active participation in the whole process of project preparation and development, to sustain development.

Social preparation (SP) means the process by which people's capacity to identify problems and constraints and the ability to identify and recognize solutions to their problems collectively are formed. For the success of the project, laying the foundation to sustain development efforts is very important prior to providing resources and services. Such capacity in the community is called self-organizing capability. Formation of social capacity means the developments and upgrading of people's self-organizing capability in substance.

Also, there exists such systems as to utilize and manage resources, formulated traditionally and empirically by the people in the community. This system shall also be positively utilized and strengthened.

## 4.3 Development Strategy and Target

### 1) Development Strategy and Its Concrete Plan

The Comprehensive Agrarian Reform Program (CARP) holds the key to agricultural and rural developments An accelerated implementation of the program to effect immediate land distribution will bring about not only social justice, but also equally important, economic productivity and alleviation of poverty among the rural population.

More than land distribution, the CARP also involves social infrastructure building to ultimately empower the people and allow them to participate in crucial decision-making process.

To attain the vision of CARP, the DAR has taken a development approach anchored on the strategy of developing viable ARCs. In order to optimize the allocation and use of limited resources and create an impact, the DAR has adopted a geographical focus. It has realigned its priorities towards the development of viable ARCs. The DAR shall intensify its interventions to increase farm production, improve household income, and promote sustainable development.

Through ARCs, DAR will demonstrate the agrarian reform works, which are achieved by a holistic development effort leading to improved quality of life, people empowerment and sustainable agro-industrial development. ARCs shall be the growth points in the countryside.

The development of viable ARCs, is a complex task. It requires a holistic approach which will facilitate growth of three development wheels, economic, environmental, and sociopolitical.

In order to achieve this, synchronized efforts from DAR and its partners shall utilize the following strategies:

a) Geographically Focused ARCs

By reasons of impact and manageability, DAR shall adopt the area-focused strategy. They are the ARCs into which DAR, its partners shall pour available and generated resources.

b) GO-NGO-PO Partnership (Multi-Sectoral and Integrated)

The development of ARCs requires complementary and synchronized efforts including resources from line agencies, NGO and PO, aimed at community-based poverty alleviation and countryside development efforts. Each partner shall have a role to play and a responsibility to assume based on expertise, available resources and experiences.

c) Acceleration of Land Tenure Improvement

The Department shall ensure security of tenure to farmer beneficiaries by accelerating land redistribution to actual tillers and improving their conditions.

d) Acceleration of Program Beneficiaries Development.

Program beneficiaries development addresses the problems of powerlessness and low income. Such two components as Social Infrastructure Building and Strengthening, and Economic and Physical infrastructure Support

Services, shall focus on organization building and strengthening, provision of credit, marketing linkages and post-harvest facilities as well as roads, irrigation facilities, water, and power supply.

e) Enhancement of Roles of Women and Youth

The ARC development focuses on uplifting and advancing the status of women and the youth and harnessing their potentials to enable them to be active players in CARP implementation.

f) Mobilization of Local and Foreign Resources

The total amount of the fund estimated by the program is earmarked for land acquisition and distribution cost requirements. The remaining amount is still inadequate to finance program beneficiaries development activities and projects.

To fill the gap, DAR has launched a resources mobilization campaign focusing on two strategies:

- Mobilizing local resources other than CARP-mandated funds (Agrarian Reform Funds), and
- Mobilizing external funds from foreign partners.

The ARCs in marginal areas are situated in more severe conditions than other ARCs. The development of the ARCs in marginal areas are more difficult, but must be given priority for development.

2) JICA Study Team's Comments on Concrete Development Plan by DAR

Although DAR proposed the above-mentioned six items as concrete means, the Japanese Study Team has made additional remarks, as follows:

a) Geographically focused ARCs:

Since geographically focused ARCs were taken when the priority model areas were selected, the Study Team has also the same views on the ARCs to be developed.

b) GO-NGO-PO Partnership (Multi-sectional and Integrated)

The Governmental Organization (GO) with DAR as the lead agency shall promote ARC development, in cooperation with related agencies through coordinating committees at the national and local levels. DAR, however, only having such functions as land distribution to the tenant farmers and coordination among the related agencies, the application of technology would only be possible with the support of other related engineering agencies.

NGOs' roles on poverty alleviation and rural development have been appreciated very much. Their concern and participation on ARC development in marginal areas, however, are very limited. It is because NGO's activities on public health, school education, etc. in the same areas, will become visually effective very soon, but their activities on the ARC development in marginal areas, on the contrary, seem not to make an impact immediately but will only slowly be felt little by little. It is desirable that NGO take an active interest and participation in the ARC development in marginal areas and play an important role in supporting the Study Team, as well as in the above-mentioned other fields.

As for PO, set-up of agricultural cooperatives in ARCs in marginal areas has been promoted. As a result, they have already been organized in almost all the ARCs in marginal areas. Their membership rate, however, has still been at low level. Enhancing the rate, the merit of the organized capacity will be indicated with the purchase of their input materials and actual selling of their agro-products.

c) Acceleration of Land Tenure Improvement

Since physical-and-geographically unfavorable lands are distributed to tenant farmers, there will still occur in some areas, problems on farm management. Although the Study Team cannot touch this problem, it is expected that DAR take some measures to solve it, hereafter.

d) Acceleration of Program Beneficiaries Development

At present, the farmers in the ARC marginal areas seem without and or with low education and with low income levels. After the infrastructures are in placed in the ARC marginal areas, there is a need for the beneficiaries to operate and maintain the facilities themselves. Accordingly, participatory approach and social preparation will therefore be indispensable. Development and

strengthening of their own organization capacity shall be implemented with the support and assistance of the Local Government Unit (LGU), DAR and NGOs.

e) Enhancement of Role of Women and Youth

In relation to item 4), it is advisable that the women and youth be involved in management activities and play important roles with the assistance and support of the LGUs and others.

f) Mobilization of Local and Foreign Resources

Utilization of more local resources is favorable, but hardly possible in the current condition. Utilization of more foreign resources will be promoted. Foreign

assistance has been provided by the World Bank, FAO, EU, Belgium, Italy, Sweden, Japan, and that of Australia is due to commence soon.

3) Basic Development Plan Set up by JICA Study Team

a) Land Use and Soil Conservation Plans

The marginal land has rolling and hilly topography with relatively thin and not fertile top soils. Also, water resources development is quite limited. Conserving land resources and land use aimed at sustainable agricultural production is required. Soil conservation measures are necessary for the land with a slope of more than eight percent.

b) Agricultural Development Plan

For the increase of agricultural production in the marginal areas, distributed land has to be utilized efficiently, including full development of the idle area. Also, it is necessary to increase the cropping intensity and unit yields of respective crops.

i) Cropping pattern

In irrigated paddy fields, double cropping of wet season paddy and diversified crops, such as, corn, beans and, vegetables will be introduced. In the gentle sloping area, corn and beans will be the stable crops. In the area of SALT contour farming and agro-forestry, the upland crops proposed to be grown will have similar cropping pattern to that of gently slopping areas. The other crops proposed will be fruit trees, coconuts, timber trees, hedgerow plants and other perennial crops.

ii) Animal husbandry fisheries and other farming plan

Based on the extensive survey of present situation and the national policy, the strategy for the livestock sub-sector development in the marginal areas is drawn up in order to overcome the constraints by effectively capitalizing on the summarized advantages.

iii) Post-harvest plan

Development of past-harvest in the marginal areas has many problems and constraints to overcome. Development potentials, however, are in the introduction and distribution of necessary equipment and facilities for post-harvest at the first stage.

iv) Marketing plan of agro-products

Provision of transportation facilities and infrastructure for marketing, improvement of post-harvest facilities, acquisition of appropriate technology will be required.

v) Farmers' institutionalization

At present, multipurpose cooperatives has already been established in all of the 12 Study Areas, with about 50 percent membership rate on the average. There is a need to raise participation rate. In the water resources development area, water uses' association shall be proposed to be established.

vi) Institutional development for supporting farmer

The conditions required for farming improvement in the marginal areas are the development of basic infrastructures, provision of farming fund, introduction of technology on seeds and animals, strengthening of farmers' organization, and technical training for the farmers, etc.

vii) Rural society development for supporting farmers:

As supporting measures, construction of at least the required basic infrastructures, establishment and strengthening of farmers' organization for upgrading beneficiary farmer social capacity, participation of women and youth in project planning, assistance/cooperation of the LGU, NGO, etc. will be required.

viii) Proposed agricultural credit system

Most of the farmers do not have enough income to purchase agricultural inputs, and even the money to purchase their most basic needs. Access to farm credit is very limited. Financial assistance shall therefore be required to help the farmers, particularly the rural poor.

c) Water resources Development Plan

Existing available and potential surface water sources shall be developed for irrigation and rural water supply but taking into consideration minimum investment since financial resources are very limited. Regarding ground water development, only one area (Region 1) has the small potential with shallow wells.

d) Agricultural Infrastructure Plan

The plan of irrigation by gravity from springs and wells is fundamental. All the available water sources should be used effectively and economically. As irrigation crops, paddy rice is top priority, with vegetables and upland crops as next priority. Water for backyard garden and nursery shall also be considered. The main irrigation facilities are small water impounding dams (SWD), intake weirs, and conveyance and distribution canals. As for the other facilities, the hedgerow plants along the contour for soil conservation, and farm roads shall also be considered.

e) Rural and Social Infrastructure Plan

Construction and maintenance of rural roads are most essential. Available water sources for the rural water supply in the marginal areas are ground water to be taken from wells and spring. Water supply is a basic human necessity for farmers to settle and reside in the marginal areas.

Since four marginal areas has not yet been energized, development plan aims to provide electrification for these four areas. For building of the human capital, one important factor is the improvement of access to educational facilities, such as construction and expansion of school buildings and improvement of access roads to schools. Besides the above, primary health care services shall be improved and multi-purpose centers shall be provided for the use of the beneficiaries.

f) Environmental Conservation and Public Health Improvement

The development of ARCs in marginal areas also aims to improve the sustainability of the life support systems while improving public health conditions and environment.

g) Basic Development Plan for Each Model Area

The overall project components are planned as follows:

- Construction and improvement of access roads to the areas
- Formulation of land use, crop selection, sloping agriculture under scarce water sources
- Development of small-scale irrigation systems
- Establishment and strengthening of farmers' organization
- Consideration for environmental conservation
- Development and strengthening of social capacity

result of soil analysis. In the steep land, coconut based multiple cropping and agroforestry, and even timber tree planting will be included, and

- Soil conservation measures and enhancement of soil fertility are most important for an increase of land productivity as well as for sustainable agricultural development. The introduction of simple conservation facilities and SALT contour farming shall be demonstrated at the farm level.

Following the above said strategy, an ecosystem approach for integrated sustainable development will be undertaken to upgrade living standard in the long term in the marginal area.

2) Target Farm Income

In the selected areas, very large number of farmers obtain their sustenance and their cash income from the small farms. In these situations, agricultural expansion must be based on increasing output from the farm sector. Poverty relief and equal development can be achieved very substantially through increase incomes to small farms. These are the reasons why the programs will be based on improving small agriculture and infrastructure development projects.

In order to achieve the purpose, future farm income is forecasted. The assessment is made for the different sizes and regions of farmers. The model is formulated with various indicators and quantities. But, the most moderate model is assumed which would match with the current farmers' situation at a gradual speed of agricultural development.

Case 1: Regions with very low farm income even though the expenditure level are quite high; Region VI and VIII
Case 2: Regions with relatively low farm income but the expenditure are relatively high level; Region XIII
Case 3: Regions with relatively good income and availability of employment opportunities with non-farm income; Regions I and III
Case 4: Regions with relatively low farm income; other regions

Expected increase of agricultural production in the selected area is five to 15 percent per annum depending on farm system, agricultural product pattern and area potential. In spite of the tendency of food production per capita (average annual growth rate) to be minus 1.3 percent from 1979 to 1993 (World Bank Report 1995, Table 4: Agriculture and food, p.168), the average annual growth rate in the selected areas could be planned with a little higher rate because of the achievement of sustainable growth.