JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF AGRARIAN REFORM (DAR)

THE FEASIBILITY STUDY ON DEVELOPMENT OF AGRARIAN REFORM COMMUNITIES IN MARGINAL AREAS IN THE REPUBLIC OF THE PHILIPPINES

MAIN REPORT

JULY, 1997

SANYU CONSULTANTS INC.
PACIFIC CONSULTANTS INTERNATIONAL

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PREFACE

In response to a request from the Government of the Philippines, the Government of Japan decided to conduct a Feasibility study of Development of Agrarian Reform Communities in Marginal Areas and entrusted the study to the Japan International Cooperation Agency (JICA).

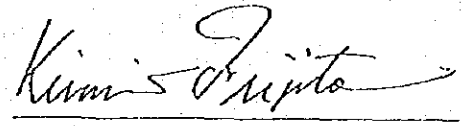
JICA sent to Philippines a study team headed by Mr. Junichi Kitamura, Sanyu Consultants Inc., three times between March 1995 and May 1997.

The team held discussions with the officials concerned of the Government of Philippines, and conducted field surveys at the study area. After the team returned to Japan, futher studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Philippines for their close cooperation extended to the team.

July, 1997



Kimio Fujita
President
Japan International Cooperation Agency

May, 1997

Mr. Kimio Fujita
President,
Japan International Cooperation Agency,
Tokyo, Japan

Letter of Transmittal

Dear Mr. Fujita,

We have a pleasure to submit to you the Final Report of the Feasibility Study on Development of Agrarian Reform Communities in Marginal Areas in the Republic of the Philippines. The report contains the advice and suggestions of the authorities concerned of the Government of Japan and your Agency, as well as the formulation of the above-mentioned project. The comments made by the officials concerned of the Government of the Republic of the Philippines during the discussions on the draft report held in Manila and Tokyo are also included in this report.

The objective of the study is to support the Comprehensive Agrarian Reform Communities Program (CARP). Model Areas were selected from Agrarian Reform Communities (ARCs) under marginal and hilly conditions with no stable water sources from 12 Regions, and a Feasibility Study on four classified Typical Model Areas to set up the development plan was 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 was also prepared.

The implementation of the Project was regarded as feasible technically and economically, and contributive to the improvement of the depressed farm condition, increase of farm income and minimization of the financial disparity among other surrounding villages by means of the increase of agricultural production.

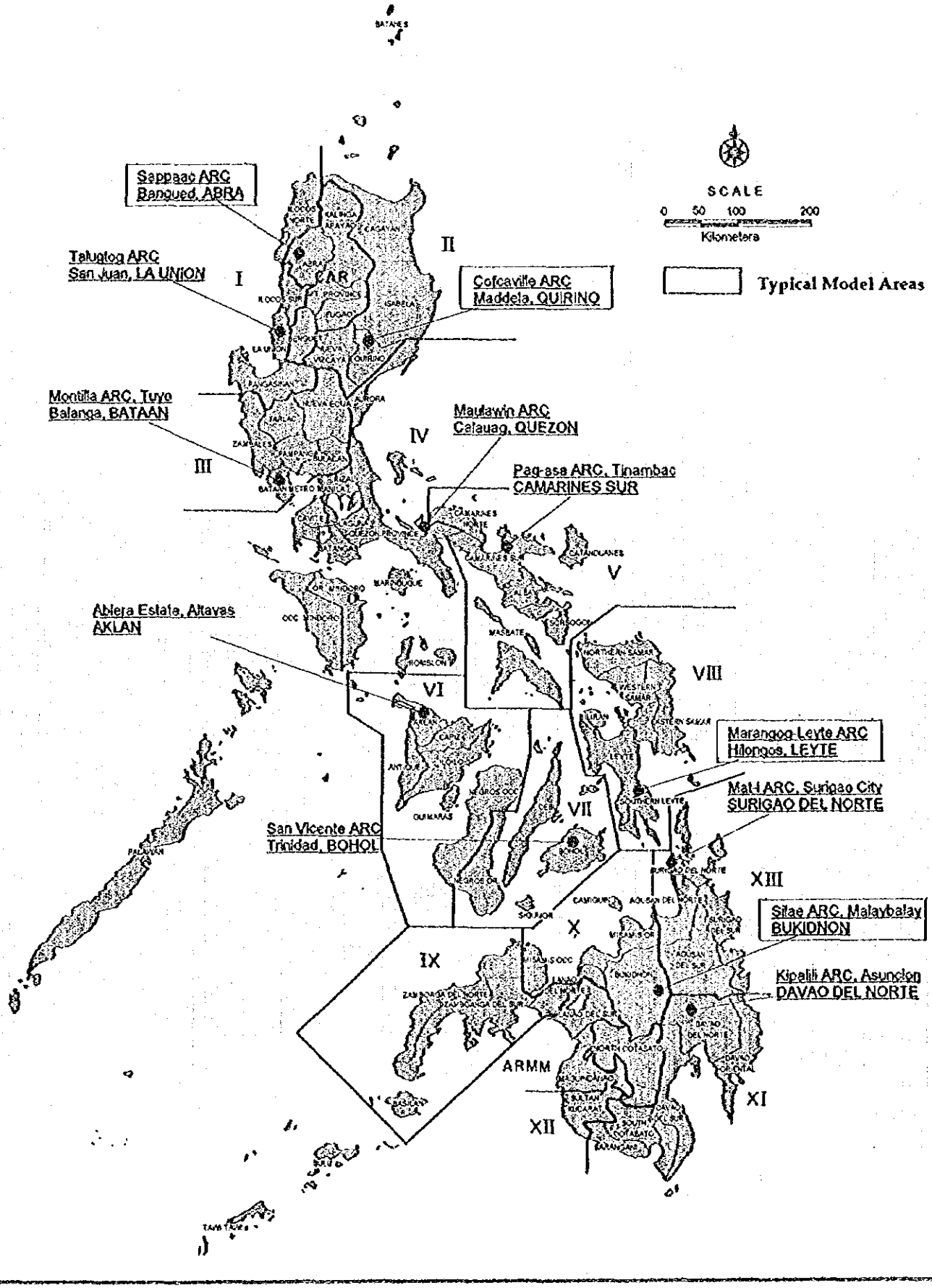
We wish to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs, the Ministry of Agriculture, Forestry and Fisheries and the Embassy of Japan for the Republic of the Philippines. We also wish to express our deep gratitude to the officials concerned of the Government of the Republic of Philippines for the close and cordial cooperation and assistance extended to us during our study.

Very truly yours,

J. Kitamura

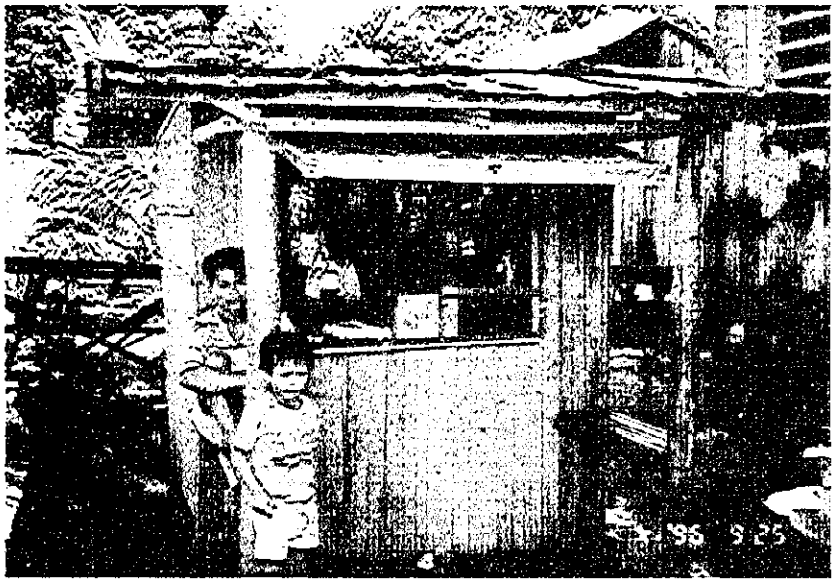
Junichi KITAMURA
Team Leader
The Feasibility Study
on Development of ARCs
in Marginal Areas

LOCATION MAP OF STUDY AREAS



Explanation of study contents and procedures to the local people and discussion on local people's demand (Marangog Area)

Survey of rural water supply facilities with a participation of local people (Marangog Area)



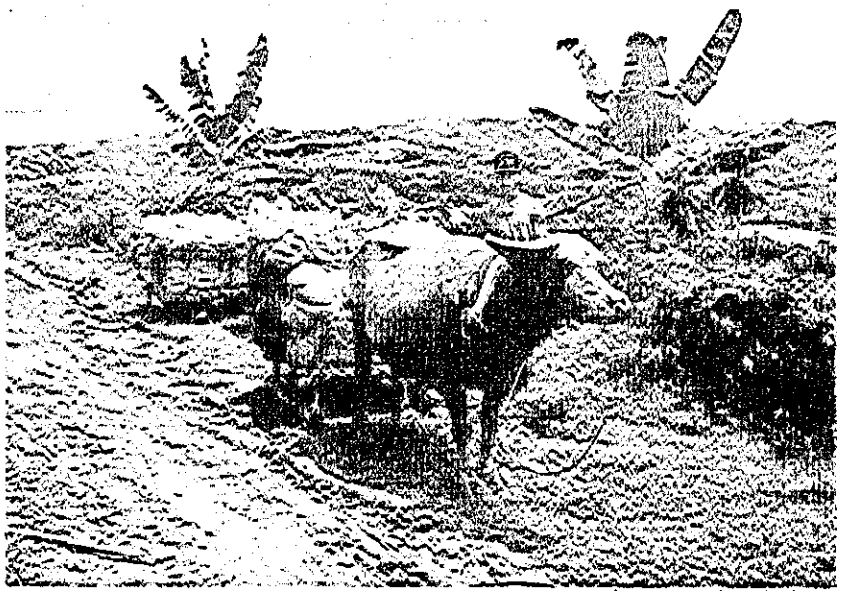
Sari-Sari store managed by farmer's cooperatives (Silae Area)

Paddy drying works on multi-purposes pavement (Silae Area)

Shallow well to supply water for dry season crops (dia.=2.0 m, dep.=9.0 m) (Talugtog Area)

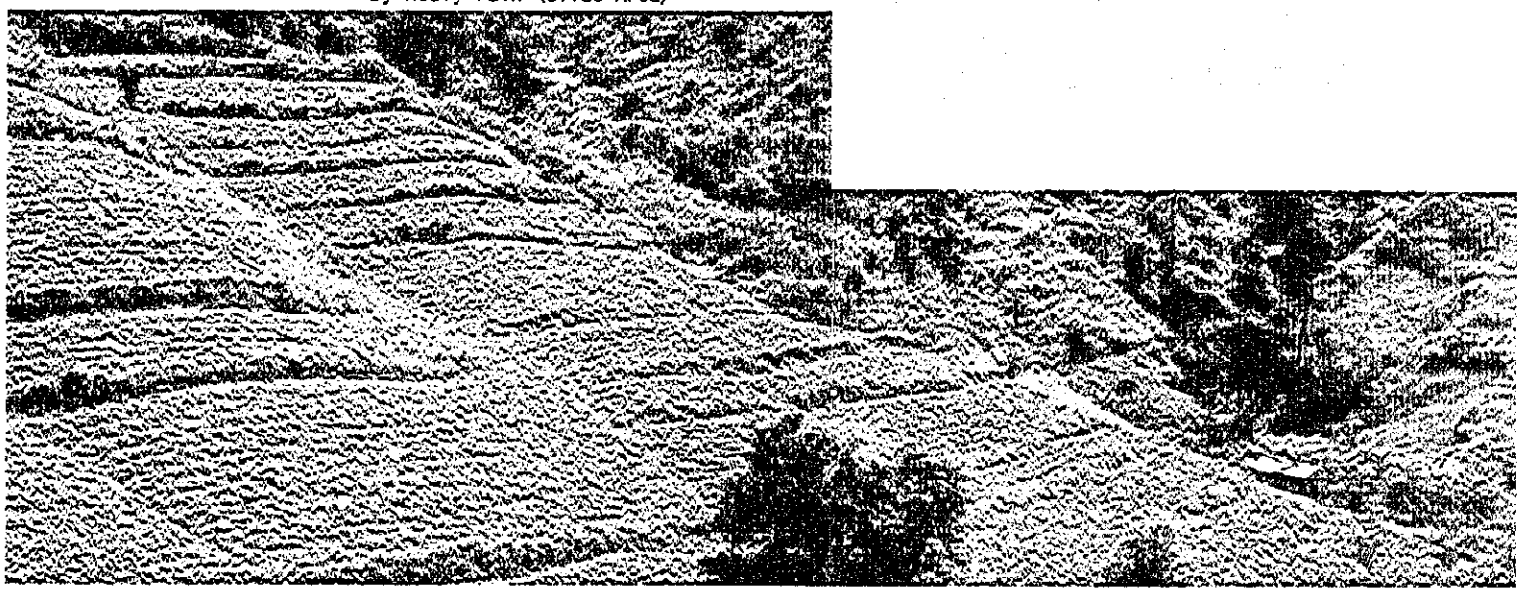
Intercropping cultivation with banana and mango for effective land use (Sappaac Area)

Rural roads to access the area: no pavement resulting in impassable during wet season (Kipalili Area)



Transportation of abaca by carabao: transportation cart is sled due to bad road conditions in the area (Marangog Area)

Cultivated hilly land for corn production and causing soil erosion during wet season by heavy rain (Silae Area)



Contour line farming area introducing sloping agricultural land technology (SALT) with the provision of soil erosion countermeasures (Silae Area)

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ABBREVIATIONS

1. Related Agencies

ADB	: Asian Development Bank
APC	: Agricultural Promotion Center (Bohol)
ATI	: Agricultural Training Institute
BAEx	: Bureau of Agricultural Extension
BAI	: Bureau of Animal Industry
BAR	: Bureau of Agricultural Research
BARBD	: Bureau of Agrarian Reform Beneficiary Development
BARCs	: Barangay Agrarian Reform Councils
BARIE	: Bureau of Agrarian Reform Information and Education
BAS	: Bureau of Agricultural Statistics
BDCD	: Beneficiaries Development and Coordination Division
BFAR	: Bureau of Fisheries and Aquatic Resources
BFD	: Bureau of Forest Development
BL	: Bureau of Lands
BOPHRE	: Bureau of Post Harvest Research and Extension
BPI	: Bureau of Plant Industry
BSWM	: Bureau of Soils and Water Management
CAR	: Cordillera Administrative Region
CBP	: Central Bank of the Philippines
CDA	: Cooperative Development Authority
CDF	: Countryside Development Fund
CENRO	: Community Environment and Natural Resources Office
CIDA	: Canadian International Development Authority
CIT	: CARP Implementing Team
CPMO	: Central Project Management Office
CRECOM	: Credit Committee
CVIARC	: Central Visayas Integrated Agricultural Research Center
DA	: Department of Agriculture
DAR	: Department of Agrarian Reform
DARAB	: DAR Adjudication Board
DARCO	: Department of Agrarian Reform Central Office
DARMO	: Department of Agrarian Reform Municipal Office
DARPO	: Department of Agrarian Reform Provincial Office
DARRO	: Department of Agrarian Reform Regional Office
DBM	: Department of Budget and Management
DECS	: Department of Education, Culture and Sports
DENR	: Department of Environment and Natural Resources
DFA	: Department of Foreign Affairs
DILG	: Department of Interior and Local Government
DOF	: Department of Finance
DOH	: Department of Health
DOJ	: Department of Justice
DOLE	: Department of Labor and Employment
DOST	: Department of Science and Technology
DOTC	: Department of Transportation and Communication
DPWH	: Department of Public Works and Highways
DSWD	: Department of Social Welfare and Development
DTI	: Department of Trade and Industry

EDCOM	: Education Committee
ELCO	: Electric Cooperative
ELECOM	: Election Committee
EOJ	: Embassy of Japan
EVIARC	: Eastern Visayas Integrated Agricultural Research Center
FORI	: Forest Research Institute
FPA	: Fertilizer and Pesticide Authority
GO	: Government Organization
GOJ	: Government of Japan
GOP	: Government of the Philippines
HLURB	: Housing and Land Use Regulatory Board
HRMO	: Human Resources Management Office
IBRD	: International Bank for Reconstruction and Development
IMF	: International Monetary Fund
IPB	: Institute of Plant Breeding
IRRI	: International Rice Research Institute
JICA	: Japan International Cooperation Agency
LA	: Land Authority
LBP	: Land Bank of the Philippines
LDC	: Livestock Development Council
LGU	: Local Government Unit
LRA	: Land Registration Authority
LRDC	: Land Resettlement and Development Cooperation
LTA	: Land Tenure Administration
MAO	: Municipal Agriculture Office
MEO	: Municipal Engineering Office
MHO	: Municipal Health Office
MSWD	: Municipal Social Welfare and Development
NABC	: National Artificial Breeding Center
NAMRIA	: National Mapping and Resources Information Authority
NARRA	: National Resettlement and Rehabilitation Administration
NARRDN	: National Agricultural Resources Research Development Network
NEDA	: National Economic and Development Authority
NGOs	: Non-Governmental Organizations
NIA	: National Irrigation Administration
NLRC	: National Land Reform Council
NLSF	: National Livelihood Support Fund
NMIC	: National Meat Inspection Council
NOMIARC	: Northern Mindanao Integrated Agricultural Research Center
NSCB	: National Statistical Coordination Board
NSO	: National Statistic Office
OECF	: Overseas Economic Cooperation Fund
PAGASA	: Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAHC	: Philippine Animal Health Center
PARC	: Presidential Agrarian Reform Council
PAO	: Provincial Agriculture Office

PARCCOMs	: Provincial Agrarian Reform Coordinating Committees
PBD	: Program Beneficiary Division
PBDCD	: Program Beneficiary Development Coordination Division
PCA	: Philippines Coconut Authority
PCC	: Philippine Carabao Center
PCGG	: Presidential Commission on Good Government
PDC	: Philippines Dairy Corporation
PDI	: Project Development Implementation
PENRO	: Provincial Environment and Natural Resources Office
PFDA	: Philippines Fisheries Development Authority
PHILRICE	: Philippines Rice Research Institute
POs	: People's Organizations
PPDO	: Provincial Planning and Development Office
PPMO	: Provincial Project Management Office
PSSPC	: Provincial Service Station Production Center
RADDL	: Regional Animal Disease Diagnostic Laboratory
RDC	: Regional Development Council
RIARC	: Regional Integrated Agricultural Research Center
ROD	: Register of Deeds
ROS	: Research Outreach Station
RRESs	: Regional Research and Extension Station
SAIC	: Supervisory Audit and Inventory Committee
UN	: United Nations
UNDP	: United Nations Development Program
UP	: University of the Philippines
ViSCA	: Visayas College of Agriculture

2. Glossaries

A&D Lands	: Alienable and Disposal Lands
AFF	: Agro-Forestry Farms
AITTP	: Agro-Industrial Technology Transfer Program
AO	: Administrative Officer
APT	: Assets Privatization Trust
ARCs	: Agrarian Reform Communities
ARF	: Agrarian Reform Fund
ARBs	: Agricultural Reform Beneficiaries
ARPO	: Agrarian Reform Program Officer
ARPT	: Agrarian Reform Program Technologist
BOT	: Build-Operate-Transfer
CA	: Compulsory Acquisition
CARL	: Comprehensive Agrarian Reform Law
CARP	: Comprehensive Agrarian Reform Program
CARP-IC	: Comprehensive Agrarian Reform Program-Irrigation Component
CARP-SIP	: Comprehensive Agrarian Reform Program-Small Irrigation Project
CARPO	: Chief Agrarian Reform Program Officer
CBU	: Capital Build-Up
CCHP	: Comprehensive Community Health Program
CDF	: Countryside Development Fund
CE	: Civil Engineer

CF	: Claim Folder
CITs	: Carp Implementing Teams
CLOA	: Certificate of Land Ownership Award
CLT	: Certificate of Land Transfer
COOP	: Cooperative
CPI	: Consumer Price Index
DF	: Development Facilitator
DPS	: Direct Payment Scheme
EP	: Emancipation Patent
FB	: Farmer Beneficiary
FIES	: Family income and Expenditure Survey
FMD	: Food and Mouth Diseases
GDP	: Gross Domestic Product
GNP	: Gross National Product
GRDP	: Gross Regional Domestic Product
GFI	: Government Financing Institutions
GOL	: Government-Owned Lands
IRA	: Internal Revenue Fund
ISF Lands	: Integrated Social Forest Lands
LE	: Landed Estate
LO	: Leasehold Operation
LIT	: Land Investment Trust
LO	: Leasehold Operation
LT	: Land Transfer
LTI	: Land Tenure Improvement
MARO	: Municipal Agrarian Reform Officer
MTPDP	: Medium-Term Philippine Development Plan
NA	: Notice of Acquisition
ODA	: Official Development Assistance
OLT	: Operation Land Transfer (rice and corn)
PARO	: Provincial Agrarian Reform Officer
PARSSO	: Provincial Agrarian Reform Support Services Officer
PD	: Presidential Decree
PDI	: Project Development Implementation
RDF	: Regional Development Fund
RHU	: Rural Health Unit
SAC	: Special Agrarian Court
SALT	: Sloping Agriculture Land Technology
SARPO	: Senior Agrarian Reform Program Officer
SARPT	: Senior Agrarian Reform Program Technologist
SLE	: Settlement and Landed Estates
SSO	: Support Service Office
SUARPO	: Supervising Agrarian Reform Program Officer
TI	: Title of Lands

VLT	: Voluntary Land Transfer
VOS	: Voluntary Offer to Sell

3. Others

ARC Areas	: Agrarian Reform Community Areas including Marginal Areas
Barangay	: Political subdivision of a municipality comprising sitio
Carabao	: The animal that most farmer use for plowing and other farming works. It is about the size of an ox and is similar to the water buffalo in other countries.
Cavan	: Common unit of volume for crops equivalent to 50 kg of grains (seed: 40 kg)
Cogon	: Coarse grass which usually covers idle land or abandoned clearing
Fiesta	: Spanish term for feast, celebrated pompously once a year to honor the patron saint.
Ganta	: Common unit of volume for rice equivalent to 2.24 kg of milled rice
IR	: High yielding variety of palay which bears varieties from IRRI
Kaingin	: Deforestation by shifting cultivation with slashing and burning forest/brush
Model Areas(Study Areas)	: Representative 12 Marginal Areas in 12 Regions
Monsoon	: Predict wind that blows from the sea to the continent and opposite in winter
Municipality	: Political subdivision of a province comprising barangays
Nipa	: Heavy leafed type of palm used in hatching huts
PAKISAMA	: Pambansang Kilusan Samahan Ng Magsasaka (Nationwide Organization of Farmers)
Palay	: Paddy, unhusked rice, sometimes called rough rice
Poblacion	: Political center of a town
Province	: Political subdivision of the country comprising municipality(s) and city(s)
Share Tenancy	: A practice where tenants rent the lands they work and pay rentals by sharings of cash or crops grown
Sitio	: Minimum unit of political subdivision
Survival Rate	: The number who graduate/the number who enroll
Trade Wind	: One of three Philippines air currents, comprising from a generally eastern direction reaching the island during the period form February to April
Typical Model Areas	: Selected Model Areas

4. Unit of Measurements

mm	: millimeter
cm	: centimeter
m	: meter
km	: kilometer
sq.m	: square meter
sq.km	: square kilometer
ha	: hectare

l, lit.	: liter
cu.m	: cubic meter
MCM	: million cubic meter
lit/sec	: liters per second
cu.m/sec	: cubic meter per second
ppm	: parts per million
pH	: potential of hydrogen
EC	: electric conductivity
g	: gram
kg	: kilogram
t, ton	: metric ton
sec.	: second
min.	: minute
hr.	: hour
ave.	: average
min.	: minimum
max.	: maximum
%	: percent
No.	: number
°C	: degree centigrade
ET	: evapo-transpiration
N	: nitrogen
P	: phosphate
K	: potassium
Peso	: Philippine peso
US$	: US Dollar = 26.2 peso (Sept. 1996)

SUMMARY AND RECOMMENDATION

I. FORMULATION OF BASIC DEVELOPMENT PLAN

SUMMARY

A. INTRODUCTION

A. 1 Background and Implementation of the Study

The important concern of the Comprehensive Agrarian Reform Program (CARP) is the alleviation of poverty and raising of the standard of rural living by means of distributing farm lands to poor farmers and rural workers without lands, which are 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 lands to be distributed are situated far from the main communities without suitable water sources such as creeks, spring and groundwater. It is located in hilly areas that are undulating , not yet reclaimed and developed. Also, since the support services for infrastructure arrangement from the Department of Agrarian Reform (DAR) are limited for lack of budget, personnel, etc., it can not be said that the initial purposes of the Program has been fully achieved, in spite of the wide distribution of lands.

Considering the circumstances, the Government of the Republic of the Philippines requested the feasibility study for establishing the above-mentioned development plan to the Government of Japan in August, 1994.

The study was implemented in the following two phases:

Phase-I Study

The Phase-I study was implemented from the beginning of March, 1996 to the end of July, 1996. In this period, field works/studies were undertaken to understand the present situation, clarifiy problems and constraints, and identify development potential in the Areas. On the basis of the findings, the basic development plan for each Model Area was formulated. Furthermore, with the classification of the 12 Model Areas, four Typical Model Areas, as, Sappaac ARC (Reg.-CAR), Cofcaville ARC (Reg.-II), Marangog ARC (Reg.-VIII) and Sifae ARC (Reg.-X), were selected in close cooperation with DAR and related Philippine Government staff.

Phase-II Study

The Phase-II study was conducted from the beginning of September, 1996 to the end of February, 1997. During this period, feasibility studies on the selected four Typical Model Areas were also undertaken.

A. 2 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. Also, a Feasibility Study to set up the development plan will be carried out for the purposes 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 guidelines on studying methods regarding respective study items, and procedures and ideas for making plans will be transferred to the Philippine counterpart staff.

A. 3 Progress of Comprehensive Agrarian Reform Program

The 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, the program was extended for two and half year untill the end of 2000. As of 1995, the progress and rate of land distribution under the jurisdiction of DAR and DENR are indicated as follows:

Progress of Land Distribution under CARP

(unit : '000 ha)

Item	Initial Plan (in 1987)	Modified Plan (End of 1996)	Progress (End of 1995)	Progress Rate (to Modi. Plan)
By DAR	3,820.6	4,467.6	2,191.7	49 %
By DENR	6,475.0	3,539.6	1,485.0	42 %
Total	10,295.6	8,007.2	3,676.7	46 %

Source: Report prepared by JICA-DAR Expert

The progress of land distribution to farmers under the CARP Program was 78 percent on the average for 12 Model Areas, as of 1996. Of the 12 Model Areas, four areas such as, Cofcaville ARC(Reg.-II), Montilla ARC (Reg.-III), Maulawin ARC (Reg.-IV) and Kipalili ARC (Reg.-XI) completed their land distribution. Abiera ARC is lagging behind in the distribution schedule with a progress rate of only six percent against the programmed target.

B. PRESENT CONDITIONS AND PLANS OF THE STUDY AREAS

B. 1 Physical Conditions

1) Location, Area and Topographic Conditions

Location and Areas

The Study Areas (Model Areas) for the Feasibility Study of Development of Agrarian Reform Community in Marginal Areas are located nationwide. The areas were originally 14 Model Areas. However, two Model Areas were excluded due to peace and order condition, after discussions 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 areas 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	Madulla, Quirino Province	490
III	Montilla ARC	Tuyo, Balanga, Bataan Province	108
IV	Maulawin ARC	Calauag, Quezon Province	321
V	Pag-asa ARC	Tinambac, Camarines Sur Province	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 Province	164
XI	Kipalili ARC	Asuncion, Davao Province	327
XIII	Mat-i ARC	Surigao City, Surigao del Norte	200
Total			3,534

Topographic Conditions

Topography of all the identified Study Areas is rolling and sloping. The elevation of the different Areas varies substantially from 40 m to more than 600 m above mean sea level. The slope of the Areas are 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.

2) Meteorological and Hydrological Conditions

Climate in the Philippines has been described in terms of rainfall distribution received in a locality. The climate conditions around the Study Areas are categorized into four types as shown below:

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 during wet season. Maximum rainfall generally occurs 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, because it has a dry season.

B. 2 Administration, Socio and Farm Economic Conditions

1) Administration and Rural Organization

The Barangay Agrarian Reform Council (BARC) is an implementing and coordinating mechanism at the barangay level on all matters related to agrarian reform. 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 identified priority marginal areas are all governed by the existing administrative and rural organization. However, the level of organization development differs in each area. Where BARCs are still functional and active, it becomes the entry point of organization development. In instances where NGO/POs are present in ARC areas, the DAR undertakes 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.

2) Population and Farm Household

From the data presented, it can be seen that the Montilla ARC has the most number of population and farm household (2,611 and 479, respectively), while Cofcaville ARC has the least number, 806 population and 109 farm household, respectively of the 12 Study Areas. However, as to farm household beneficiaries in the specific marginal area, Maulawin Study Area has the most number while Montilla has the least number.

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. Farmer beneficiaries are either given individual Certificates of Land Ownership Awards (CLOA) or Mother CLOA and become co-owners of land areas. For farmer beneficiaries who are recipients of Mother CLOA, the titles are issued to the whole land holding subject for tenancy which remains undivided. The farmer beneficiaries are co-owners of the land. Once the land is subdivided to respective farmer beneficiaries/co-owners, individual CLOA is issued. For those covered under the Operation Land Transfer Program, land certificates are 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 hectares in Pag-asa ARC.

4) Living Conditions

Majority of the identified marginal areas are inaccessible during the wet season, and the most notable of which are the Pag-asa, Abiera and Marangog Areas.

Generally, the more interior parts of the marginal area are mostly trails or foot paths and are not passable during the wet season.

Agricultural activities are limited for lack of rural and agricultural infrastructures and facilities, such as irrigation and farm-to-market roads. Cultivation of crops are limited because of the dependency of the farmers on rainfall. Rainfed farming is practiced resulting to very low yields. Productions are basically for home consumption. Aside from farming, farm households raise livestock and poultry. The majority of the farmers are upland farmers working on heavily sloped lands cultivating small plots planting rice, corn, coconut, vegetables, rootcrops, banana, etc., often with techniques that contributed to very high erosion rates.

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

5) Farm Economy and Poverty Conditions

The income of most households in the Study Areas are so low that it can be classified as poor in the Philippine context. The average farm household income is 32,044 pesos per annum. The income disparities between households and regions, however, are quite large.

On the other hand, data on farm expenditure show imbalances in the revenues and expenditures of farmers in most of the Study Areas except those in CAR, Region-I and Region-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.

In 1995, a report by the National Statistical Coordination Board (NSCB) 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 being approximately 4.6 million.

In the Study Areas, the annual per capita incomes of households range from 1,325 to 19,514 pesos. Study findings show that the incomes of two Study Areas are over the poverty threshold. Except the two Areas, the survey indicates that average income is far below the national standard.

B. 3 Agricultural Conditions

1) Soil and Agricultural Crops

a) Soil and Land-Use

The soils in the Study Areas belong to any order of Inceptisols, Entisols, Alfisols, and Ultisols or any of their combinations. The number of Model Areas by category of soil fertility are as follows:

Category of Soil Fertility	No. of Model Areas
Moderate	7
Low to moderate	4
Low	1

Of the total Study Area of 3,534 ha, about 1,519 ha (or 43 percent) are cultivated areas and 2,015 ha (or 57 percent) are cogonal/shrubs and other areas. The other areas include residential, forest, etc.

According to the rural economic survey, the average farm sizes for distributed and cultivated areas for the 12 Model 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.

b) Crop Production

The main crops grown during wet season are paddy rice and corn in rice lands and vegetables and beans in the upland. Paddy rice, corn, vegetables, and beans are also grown in rice lands and uplands during dry season. Corn is planted as main crop in upland during the dry season. The major perennial crops grown are coconut, banana, and mango, found in most of the Study Areas.

2) Livestock and Inland Fisheries

Livestock farming plays important role in the complex and interdependent farming systems in the marginal areas of the Philippines. However, the 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.

In the marginal areas, cattle and carabao forms an integral part of paddy production. It is used as transportation for farm produce with simple cart, for land preparation, weed control and provision of manure in the fields. It is also used as carabeef and beef production. Therefore, the increase of carabao heads are very necessary.

Tilapia culture has already been started by some farmers in some of the marginal areas. However, production is limited for lack of water in dry season.

3) Post-Harvest, Marketing and Research/Extension

a) Post-Harvest Conditions

Generally, the 12 Areas are not yet fully developed. Post-harvest facilities are rather 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, absence of quality control and quality standards of products, and absence of pricing systems suitable to quality and limited marketing channels.

The common and more popular post-harvest equipment and facilities in the marginal areas are for rice and corn.

b) Marketing of Agricultural Products

The farmers do not have the transportation to pick up and haul their produce from the farm gate to their residence or market. This problem is

aggravated by the poor road conditions that makes entry or exit of transportation not possible specially during the wet season.

Most of the farmers sell their produce to the local traders. This indicates limited market access for the farmers and the strong influence of local traders who are free to dictate the prices paid for the farmers' produce.

c) Research and Extension

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

The practical technologies developed in the last five years are largely biased to rice and corn, and less on fruits, vegetables and flowers. The technology on agricultural development on marginal lands are only eight out of 131 subjects.

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.

Technology extension activities in the areas are carried out by the extension workers from the municipal agricultural offices. The number of extension workers are 13,000 personnel in the country. The average personnel for each municipal agricultural office is eight extension workers.

It can be said that the farmers strongly want technology supporting services rather than support of production materials.

As to supply or dispersal of adequate seeds/seedlings, the breeder seeds and foundation seeds are produced by the governmental organizations, the registered seeds by the governmental organizations and accredited selected seed-growers, and the certified seeds by accredited individual farmers, cooperatives' members or private seed companies.

d) Agricultural Credit

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. 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 still rely heavily on informal sources of credit.

4) Irrigation Water Resources

a) Available Water Resources

As almost all the Study Areas are hilly and rolling in topography with land slope less than 18 percent, water sources for irrigation purposes are very scarce and are located in lower elevations in the Area. These water sources are the rivers, creeks, springs, and wells. All the Study Areas have some type of water sources mentioned above. However, most of these water sources are dried up during the dry season, except the creek discharges.

b) Potential Water Resources

In addition to the present water sources for paddy field irrigation mentioned above, the following five sources could also be considered as potential water sources: creek discharge in Sappaac ARC (Reg.-CAR) and Abiera Estate (Reg.-VI), spring water in Cofcaville ARC (Reg.-II), river discharge situated around Marangog ARC (Reg.-VIII) and creek discharge in Silae ARC (Reg.-X).

5) Agricultural Infrastructure Conditions

a) Irrigation Conditions

Among 12 Study Areas, irrigation has been practiced only for paddy production in seven areas at very small scale, from a few hectare to maximum of 12 hectares due to scarce 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.

b) Drainage Conditions

Drainage is not serious problem in the marginal areas as topography of the areas is mostly rolling, sloping and/or mountainous, except some areas where lowlands are seen partly along creeks. In case of Silae ARC, schistosomiasis occurs at the lowland paddy area due to absence of drainage system.

6) Rural and Social Infrastructure Conditions

a) Rural Roads

Conditions of the rural roads, particularly barangay roads that are mostly earth/dirt road, are poor due to frequent rain and typhoon damages and for 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 to motor vehicles.

b) Rural Water Supply

Water for domestic use are taken from wells or springs. Among 12 marginal areas, wells are used at eight areas and springs at three areas. One area, Mat-i ARC (Reg.-XIII), has no existing domestic water source because of absence of households in the marginal area. The numbers of wells or springs are still insufficient at several marginal areas.

c) Rural Electrification

Electric power is supplied by the local electric supply cooperatives. Among 12 marginal areas, four areas, i.e. Montilla ARC (Reg.-III), Abiera Estate (Reg.-VI), Marangog ARC (Reg.-VIII) and Kipalili ARC (Reg.-XI), have no electric powers.

7) Farmers' Cooperatives and Their Activities

Farmers' Cooperatives are the most popular farmers' organization 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.

However, since major sources of funds required for their activities are capital share, loan from CBU, and LGU, and consumer store income, etc., lack of capital and delayed return of capital by members are serious problems. Under the conditions, farmers' cooperative activities, especially credit activities, have been suspended in most of the cooperatives.

8) Rural Agro-Industry

In the Study Areas, agro-industry materials are also planted, such as abaca at Abiera in Region-VI. In this area, some farmers make mats, baskets, hats, etc., as cottage industry, though not on a large scale. In other areas, however, there are no agro-industries.

9) Rural Environment and Public Health

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

infrastructure while improving the environment and public health of the agrarian reform beneficiaries.

B. 4 Formulation of Basic Development Plan

1) Objectives of the Project

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

Short-Term Objectives

- To settle the farmer beneficiaries in the Area with sustainable assistance and support,

- To preserve the environment conditions of the Area by determining proper land-use and preventing soil erosion,

- To generate productive lands by providing small-scale irrigation and drainage facilities, and farm-to-market roads,

- To strengthen productive activities by developing agricultural support and institution, such as, the provision of necessary post-harvest facilities, training, extension services, cooperative organization, peoples' social capability building etc., and

- To improve the environmental and health conditions of the Areas by providing rural water supply, electricity supply for non-energized areas, access road, school building, primary health care services and multi-purpose center.

Medium/Long-Term Objectives

- To alleviate poverty and improve welfare conditions of ARBs by giving them opportunities to increase their income by improving and/or providing the necessary agricultural infrastructures and services, and

- To increase the annual income of the households to the target level of the year 2000 in the Medium-Term Philippine Development Plan (MTPDP).

2) Land-Use Plan and Soil Conservation Measures

The marginal area has various constraints for agricultural development. Among the constraints, steep land, thin top soils with less fertility, and lack of soil moisture bring about to the farmers stagnant and low agricultural production.

In the 12 Study Areas, 57 percent of the total areas are uncultivated or non-farm lands with a slope more than eight percent, where cogon and shrubs are growing. Such lands are not suitable to grow almost all annual crops including paddy rice, upland rice, root crops, and vegetables. On the other hand, coconut and fruit trees are moderately suitable even in lands with eight to 30 percent slope. The plantation of forest trees are well suited for lands with slope of more than 18 percent up to 30 percent.

Soil conservation-based farming systems together with soil erosion control measures would be established in the marginal areas. The bio-engineering soil erosion control will be used.

The agronomic practices of strip and contour cropping will consist of alternate strips of row and creeping crops. Crop rotation will also be included. Sloping Agricultural Land Technology (SALT) will be adopted. Two rows of leguminous plants that will serve as bio-fertilizer and animal feeds will be grown between alley of annual and perennial crops.

3) Agricultural Development Plan

a) Strategy of Agricultural Development Plan

The production of rice and corn has to be increased to meet the demand for self-sufficiency through development of small scale irrigation system. The system would provide irrigation water not only for stable food production but also for other water uses required for raising cattle and carabaos, maintenance of nursery stations and establishment of orchard at the initial stage, and emergency water supply for domestic water use and fire fighting.

For the increase on agricultural production, the marginal land shall be utilized efficiently, including full development of the idle area. The existing small farm size will then be enlarged to about three hectares in size. Also, it is required to increase the cropping intensity and the unit yields of respective crops.

An agricultural land use of the rolling and hilly land shall be prepared properly according to the degree of slope as well as soil characteristics. The general land use plan shall be to formulated on the basis of the topographic map and result of soil analysis.

b) Proposed Crop Selection and Cropping Pattern

Paddy rice will be planted during wet season in the rice land. During dry season, diversified crops as corn, beans and vegetables will be grown in the irrigated rice land, even in areas that have few rains. On the other hand, corn and beans will be the major crops during wet and dry seasons in the gently sloping upland.

In the areas of SALT (8 to 18 percent of slope) and agroforestry (18 to 30 percent of slope), perennial crops as coconut, fruit trees, abaca, and pineapple may cover most of the area. The fruit trees include mango, citrus, durian, and others according to location. However, corn, upland rice, beans, and vegetables will be grown especially in the wet season.

Hedgerow of leguminous shrubs will be planted in contour/sloping areas and shall be the source of feed (forage) and organic fertilizer. Timber trees will be planted in some type of SALT contour farming and agroforesty.

c) Proposed Farming System

Farmers cultivate lands by hiring carabaos or manually due to lack of working animals. It is necessary to implement the carabao dispersal program for the small scale farmers. With sufficient number of working animals, cultivation practices are expected to be improved.

The SALT contour farming system technology will be demonstrated in the representative farms for each typical marginal area. The most suitable crops/plants and varieties of fruits trees and other perennial crops, as well as hedgerow shrubs and timber trees will be determined in each marginal area.

The target yield is tentatively estimated at 2.5 times that of the present yield in case of irrigation area. However, the target yield for the non-irrigated area is estimated at 1.5 times the present yield.

d) Animal Husbandry, Fisheries and Other Farming Plan

Based the present situation and in line with the National Policy, strategy for the livestock sub-sector development in the Study Areas will be drawn up. The main measures to be considered are as follows:

- To improve the overall productivity of livestock by making available sufficient number of high quality breeder stock,

- To organize and improve livestock, poultry and fisheries farming activities of small scale farmers through demonstration effects of model farms as well as provision of training and technical extension services,

- To promote livestock farming systems through the improvement of fodder crop production, pasture grasses and introduction of effective agriculture manual tools such as sickles and hoes in place of traditional tools,

- To establish intensive farming systems more widely, especially in high potential areas, and

- In view of present situation in the Study Areas and the recent policy emphasis, the strategy presented above should aim initially at increasing traction animals and secondly at increasing meat production.

e) Post-Harvest Plan

Post-harvest equipment and facilities (including farm machinery) to be introduced and distributed should be the same as that which has already been introduced in the Study Areas or neighboring areas. Therefore, major equipment and facilities recommended are as follows:

- Hand Tractor
- Sprayer
- Multi-purpose dryer
- Reaper
- Thresher, and
- Warehouse.

f) Marketing Plan of Agricultural Products

The following marketing plan are proposed in the Areas:

- To organize farmers for organized selling and buying,
- To provide all-weather farm-to-market roads,
- To conduct continuous organizational, managerial, and technical training programs, and
- To let cooperatives invest in transportation business and to set up the farming foundation for agricultural input.

g) Farmers' Organization Plan

Through the improvement of present problems, especially lack of capital for the activities, the following activities will be proposed based on the established and/or improved farmers' organization:

- Group production/purchase
- Planning of crop production and forwarding of products
- Training and field trip
- Group use of agricultural machinery
- Group forwarding of products and market development
- Reinforcement of auto-saving, sari-sari store activities
- Establishment of water users association

h) Institutional Development of the Support for Farmers

The following institutional development plans are proposed:

- Development of agricultural infrastructure
- Provision of efficient agricultural credit system
- Market development
- Reinforcement of technology development and extension service system
- Establishment of seeds/seedlings and animal supply system
- Strengthening of farmers' organization activities
- Continuous training of farmers

i) Social Development Support to Farmers

The following are proposed as social development support plan:

- Construction of minimum rural infrastructure
- Establishment and strengthening of farmer's organization
- Participation of women and youth
- Tapping of NGO
- Role of local government unit (LGU)

j) Proposed Agricultural Credit System

It shall propose to introduce efficient farm credit systems as follows.

- To put into action, the rural credit institutions' aim to provide necessary fund for the purpose of agricultural inputs,

- To establish credit system, government incentive shall be essential, and maximum support and arrangement would be strongly required, and

- On the other hand, private credit is already existing in the rural areas. Their influence is great and dominant in the rural area. Thus, their existence cannot be ignored.

4) Water Resources Development Plan

a) Potential Development Sites for Surface Water Resources

Surface Water to be Developed	Development Method
Sappaac ARC (Reg.-CAR)	Small water impounding dam
Cofcaville ARC (Reg.-II)	Small water impounding dam
Montilla ARC (Reg.-III)	Tank irrigation system
Pag-asa ARC (Reg.-V)	Small water impounding dam
Abiera Estate (Reg.-VI)	Pumping system
Marangog ARC (Reg.-VIII)	Tank irrigation system
Silae ARC (Reg.-X)	Diversion system
Kipalili ARC (Reg.-XI)	Diversion system

b) Potential Development Site for Groundwater Resources

Groundwater to be Developed	Development Method
Talugtog ARC (Reg.-I)	Shallow wells

5) Agricultural Infrastructure Plan

The basic concept of the irrigation plan are established as follows:

- Proposed irrigation plan shall basically be the gravity system type
- The priority for irrigation use shall be given to paddy followed by vegetables, and other upland crops.
- Irrigation system shall be simple, easy to operate and maintain, and can be repaired locally.

Irrigation systems such as small water impounding dams (SWID) are proposed taking into consideration water source availability, topographic conditions, target irrigable areas, cropping plans, etc. Facilities shall include intake weirs or small scale diversion dams, tank irrigation system with pipeline, and in some cases, shallow open well (dug well) with movable pump.

Operation and maintenance of irrigation facilities shall be carried out by the water user's association (WUAs) to be formed by the beneficiary farmers.

Drainage improvement plan shall provide proper drainage systems in the proposed paddy irrigation areas and the areas affected by Schistosomiasis.

The idea of farm land improvement plan is that farm lands shall basically remain at present conditions/slopes with provisions for erosion protection,

considering the natural topography and crops to be cultivated, as tree planting along contour line.

Farm roads shall be adequately located and distributed. Its grade shall be all-weather road with at least gravel surface, and partly with concrete surface for steep sections. Operation and maintenance of farm roads shall be undertaken by the beneficial barangays/sitios.

6) Rural and Social Infrastructure Plan

Basic concept of the rural roads and transportation plan shall provide accessibility to all barangays/sitios with all-weather road. The following rural road development plan shall be established:

- To improve, rehabilitate, upgrade and open the rural roads (farm-to-market roads) as all-weather road with at least gravel surface, and partly with concrete surface for steep sections,

- To provide adequate and solid road protection structures, drainage facilities and river crossing structures,

- To provide concrete pavement roads in barangay/sitio centers for multi-purpose uses,
- To reinforce the motor pool of LGUs, particularly provincial and municipal governments,

- To provide vehicles for public transport system to be newly established.

Operation and maintenance of rural roads shall be carried out by LGUs, that is, barangay roads by the barangay unit with the assistance of the municipal or provincial government for road maintenance equipment.

Basic concept of the rural water supply plan shall be as follows:

- Proposed operation level of the rural water supply shall be level-I system, and level-II system, if possible, by gravity pipeline, and

- When groundwater is used as water source, deep well is recommended.

The proposed major rural water supply facilities are

- Deep well and spring development in level-I system, and

- Spring development in level-II system.

The operation and maintenance of both level-I and level-II systems shall be carried out by beneficiary communities so called the barangay Water and Sanitation Association (BWSA).

Since four marginal areas have not yet been energized, development plan aims to provide electric power line to these four Areas.

For other rural and social infrastructure plan, it is very necessary to provide and improve primary health care centers, basic education facilities, multi-purpose centers, and other facilities and services.

7) Small-Scale Rural Agro-Industry Development Plan

There are many problems and constraints for the development of the rural agro-industry even on small scale in the marginal areas. If the cooperatives are better organized and the other infrastructure conditions become available, development potentials of agro-industry also would become viable.

According to the above concept and farmer's conceived plans, the development for the rural agro-industry on small scale will be done with the introduction of the following equipment and facilities:

- Rice mill with solar dryer and equipment for quality control,
- Corn mill with solar dryer and equipment for quality control,
- Collecting and selecting facilities for banana and mango,
- Collecting facilities with solar dryer for coconut, and
- Incidental facilities such as warehouse.

8) Environmental Conservation and Public Health Improvement

The development of the marginal areas also aims to improve the sustainability of the life support systems while improving the public health conditions and the environment. Enhancement of the carrying capacity of the environmental resources of the Areas should meet the intergeneration basic needs. Ecological approach to conservation-based farming systems will rehabilitate, conserve, and protect the landscape of the ARC. This component will focus on soil conservation, rehabilitation of the forest cover and the stream corridor, and public health related to environmental conservation.

9) Basic Development Plan for Each Model Area

a) Project Components for Each Model Area

The overall project components are planned considering following development concept:

- Improvement/construction 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/strengthening of farmers' organization
- Raising and upgrading of social capacity
- Consideration for environmental conservation

b) Project Features and Costs

The project features and the preliminary estimated project costs are shown in Table B-1.

TABLE B-1 PROJECT FEATURES FOR 12 MODEL AREAS AND THEIR COSTS

Item	Sappaac (Region-CAR)		Talugtog ARC (Region-1)		Cofcaviila ARC (Region-2)		Montalilla ARC (Region-3)		Maulawin ARC (Region-4)		Pag-asa ARC (Region-5)		Abierra Estate (Region-6)		San Vicente ARC (Region-7)		Marangog ARC (Region-8)		Silae ARC (Region-10)		Kipalili ARC (Region-11)		Mat-i ARC (Region-13)	
1. Areas, Population and Farm Household																								
1.1 Areas (ha)																								
a) Study Areas	375		167		490		108		321		307		289		375		330		173		327		200	
b) Ratio of Area less than 18% of Land Slope (%)	71		77		68		95		70		81		24		85		46		55		38		30	
c) Proposed Cultivation Area (lessthan 30%)	310		145		428		99		266		246		106				210		114		121		115	
1.2 Population																								
a) Total Population	1,159		896		806		2,611		1,700		817		2,219		2,388		1,503		1,616		2,468		3,181	
b) Farm Household (Barangay)	189		163		109		479		302		142		409		432		247		327		423		590	
c) Farm Household (Study Area)	189		139		179 *		63		287		120		114		279		247		115		119		150	
Permanent	179(95%)		110(79%)		121(68%)		16(25%)		219(76%)		120(100%)		76(67%)		190(68%)		238(96%)		3(3%)		117(98%)		0(0%)	
Transient	10		29		58		47		68		0		38		89		9		112		2		150	
1.3 Proposed Main Crop	Paddy Rice		Paddy Rice		Corn, Banana		Mango, Vegetable		Citrus, Coconut		Coconut, Coffee		Coconut, Banana		Corn, Coconut		Coconut, Corn		Corn, Mango		Corn, Mango		Coconut, Banana	
2. Agricultural and Rural Infrastructural Facilities	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
2.1 Construction Costs		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)		(P'000)
a) Agricultural Development																								
1) Nursery	0.05 ha	161	0.15 ha	2,058	0.05 ha	161	0.15 ha	2,058	0.15 ha	2,058	0.15 ha	2,058	0.15 ha	2,058	0.15 ha	2,058	0.05 ha	161	0.05 ha	161	0.15 ha	2,058	0.15 ha	2,058
2) Training & On-farm Demonstration Farm	1 place	195	1 place	812	1 place	195	1 place	812	1 place	812	1 place	812	1 place	812	1 place	812	1 place	195	1 place	195	1 place	812	1 place	812
3) Livestock Dispersal	15 heads	300	10 heads	200	15 heads	300	5 heads	100	15 heads	300	15 heads	300	15 heads	300	15 heads	300	15 heads	300	15 heads	300	15 heads	300	15 heads	
4) Animal Breeding Center	50 sq.m	215	20 sq. m	110	50 sq. m	215	20 sq.m	110	20 sq.m	110	20 sq.m	110	20 sq.m	110	20 sq.m	110	50 sq.m	215	50 sq.m	215	20 sq.m	110	20 sq.m	110
5) Poultry Incubator	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80	1 unit	80
Sub-Total		951		3,260		951		3,160		3,360		3,360		3,360		3,360		951		951		3,360		3,060
b) Agricultural Infrastructure Development																								
1) Irrigation Development	1 SWID	5,635	20 wells	3,000	1 SWID	2,794	Tank(7ha)	1,400	1 SWID	5,660	1 SWID	5,356	-	-	1 SWID	5,280	1 Intake	6,859	2 Intake	3,433	1 Intake	1,456	-	-
2) Drainage Improvement	1,200 m	299	44 ha	660	600 m	165	7 ha	105	20 ha	300	12 ha	180	-	-	10 ha	150	-	-	1,480 m	899	12 ha	180	-	-
3) Farm Roads Development	3.3 km	5,750	3.0 km	2,700	8.7 km	12,914	2.6 km	3,860	2.8 km	4,040	5.5 km	8,250	-	-	4.8 km	5,460	3.2 km	6,398	2.7 km	5,075	6.6 km	8,720	-	-
4) Farm Land Conservation	-	-	20 ha	400	-	-	10 ha	200	30 ha	600	30 ha	600	30 ha	600	40 ha	800	-	-	-	-	30 ha	600	20 ha	400
Sub-Total		11,684		6,760		15,873		5,565		10,600		14,386		600		11,690		13,257		9,407		10,956		400
c) Rural Infrastructure Development																								
1) Rural Roads Development	6.8 km	11,513	1.5 km	22,800	3.8 km	8,872	4.0 km	19,700	5.0 km	21,500	11.0 km	28,100	12.2 km	41,560	10.0 km	30,400	4.6 km	17,581	LS	600	8.0 km	25,300	2.5 km	7,700
2) Rural Water Supply Development	9 places	2,160	5 places	1,450	-	-	3 places	760	4 places	1,160	9 places	2,160	6 places	1,520	2 places	480	1 place	1,450	5 places	1,200	7 places	1,680	-	-
3) Other Social Infrastructure	LS	500	LS	1,150	LS	460	LS	280	LS	270	LS	960	LS	810	LS	1,000	LS	430	LS	1,430	LS	1,250	LS	100
4) Rural Electrification	-	-	-	-	-	-	4.0 km	1,200	-	-	-	-	5.5 km	1,650	-	-	-	-	3.5 km	1,050	9.0 km	2,700	-	-
5) Strengthening Motor Pool for O & M works	LS	15,000			LS	15,000											LS	15,000	LS	15,000				
Sub-Total		29,173		25,400		24,332		21,940		22,930		31,220		45,540		31,880		34,461		19,280		30,930		7,800
d) Post-Harvest & Agro-Industry Facilities																								
1) Agricultural Machinery	LS	33	LS	202	LS	1,545	LS	1,585	LS	172	LS	30	LS	30	LS	172	LS	57	LS	51	LS	45	2 places	
2) Post Harvest & Agro-Industry Facilities	2 places	2,593	1 places	1,454	2 places	4,327	1 place	758	3 places	1,986	2 places	1,584	2 places	1,536	1 place	2,100	2 places	1,630	1 place	2,233	3 places	1,970		772
Sub-Total		2,626		1,656		5,872		2,343		2,158		1,614		1,566		2,272		1,687		2,284		2,015		772
e) Institutional Development																								
1) Community Development Program	1 place	670	1 place	670	1 places	670	1 place	670	1 place	670	1 place	670	1 place	670	1 place	670	1 place	670	1 place	670	1 place	670	1 place	670
Sub-Total		670		670		670		670		670		670		670		670		670		670		670		670
TOTAL		45,104		37,746		47,698		33,678		39,718		51,250		51,736		49,872		51,026		32,592		47,931		12,702
2.2 Community Development & Support Services	LS	3,842				3,842											LS	3,842	LS	3,842				
TOTAL		3,842				3,842												3,842		3,842				
2.3 Associated Costs																								
a) Pre-Engineering Cost (5% of 2.1)	LS	2,255	LS	1,887	LS	2,385	LS	1,684	LS	1,936	LS	2,563	LS	2,587	LS	2,494	LS	2,551	LS	1,630	LS	2,397	LS	635
b) Administration Cost (10% of (2.1+2.2))	LS	4,895	LS	3,775	LS	5,154	LS	3,368	LS	3,972	LS	5,125	LS	5,174	LS	4,987	LS	5,487	LS	3,643	LS	4,793	LS	1,270
c) Consulting Services (refer to Table N 2-13)	LS	7,104	LS	3,775	LS	7,104	LS	3,368	LS	3,972	LS	5,125	LS	5,174	LS	4,987	LS	7,104	LS	7,104	LS	4,793	LS	1,270
TOTAL		14,254		9,437		14,643		8,420		9,930		12,813		12,935		12,468		15,142		12,377		11,983		3,175
2.4 Land Aquisition	LS	528				1,016												366		498				
TOTAL		528				1,016												366		498				
2.5 Physical Contingency (10% of 2.1+2.2)		4,895		3,775		5,154		3,368		3,972		5,125		5,174		4,987		5,487		3,643		4,793		1,270
GRAND TOTAL		68,622		50,958		72,353		45,466		53,620		69,188		69,845		67,327		75,861		52,951		64,707		17,147
3. Classification of Model Areas and Selection of Typical Model Area																								
3.1 Classification of Model Areas																								
a) By Various Elements of Present Conditions	Cluster-1		Cluster-2		Cluster-2		Cluster-1		Cluster-1		Cluster-2		Cluster-3		Cluster-3		Cluster-3		Cluster-3		Cluster-3		Cluster-3	
b) By Project Development Type	Type-I, II		Type-I		Type-III		Type-III		Type-III		Type-III		Type-IV		Type-III		Type-IV		Type-IV		Type-IV		Type-IV	
3.2 Selection of Typical Model Areas	◎				◎												◎		◎					

* Many beneficiaries reside outside of the Project Area, hence, the farm household is larger than the barangay household.

B. 5 Classification of Model Areas and Selection of Typical Model Areas

1) Classification of Model Areas

The classification of 12 Model Areas into similar groups is studied taking into consideration development pattern and methods, social capacity such as establishment conditions of communities (barangay and sitio), area custom and practices, marketing systems, topography, natural conditions, etc. These classification analyses are made in the following two cases;

- Classification of Areas by prevailing present conditions in the areas, and
- Classification of Areas by project development plan for each areas.

The former analysis is made applying statistical method with quantitative evaluation for prevailing elements of present conditions for each Model Area. The latter is prepared by development pattern of the Areas.

a) Classification of Areas by Prevailing Present Conditions

Related Elements for Classifying the Model Areas

In order to classify the 12 Model Areas into similar groups, four major subjects as, i) poverty conditions, ii) living conditions, iii) production conditions, and iv) development potential, are taken into consideration.

In the individual evaluation, relations between evaluation indices and their rankings are simply explained as follows;

Rank-3 :	Best or highest in positive factor and/or least or lowest in negative factor of evaluation indices,
Rank-2 :	Medium in both positive and/or negative factor, and
Rank-1 :	Worst or lowest in positive factor and/or most or highest in negative factor.

Applied Methods for Classification of Model Areas

The classification analyses for 12 Model Areas are made by applying two statistical methods, that is, the Principal Component Analysis and the Cluster Analysis.

As a most adequate number of cluster for classifying 12 Model Areas, three clusters are selected. However, the selection of Typical Model Areas for the whole Study Areas are undertaken considering the results obtained in the study by means of the development plan mentioned below.

b) Classification of Areas by Project Development Plan

The components of the development plan for each Area is described as shown below:

- Improvement and enhancement plans for institutional capacity in the rural areas,
- Land-use and soil conservation plans,
- Farm management and agricultural supporting service plans,
- Water resource development plan,
- Agriculture infrastructure plan,
- Rural infrastructure plan,
- Rural agro-industry plan,
- Environmental conservation and rural health improvement plans.

Of the components mentioned above, land-use and environmental conservation plans (presented by ratio of cultivation and cultivable areas), water resource plan (type of water resources facilities and irrigation methods), and agricultural farm management plan (introduced crops and cropping pattern) are considered to be essential and prerequisite for the whole Areas. The classification of Model Areas by means of project development plan is prepared based on these three main project components.

The 12 Model Areas are classified into the following three clusters and four types of development plans considering the study on Model Area classification.

Classification of 12 Model Areas

	Principal Component and Cluster Analyses			
	Cluster-1	Cluster-2	Cluster-3	Development Type
Sappaac ARC (Reg.-CAR)	○			I, II
Talugtog ARC (Reg.-I)		○		I
Cofcaville ARC (Reg.-II)		○		III
Montilla ARC (Reg.-III)	○			III
Maulawin ARC(Reg.-IV)	○			III
Pag-asa ARC (Reg.-V)		○		III
Abiera Estate (Reg.-VI)			○	IV
San Vicente ARC (Reg.-VII)			○	III
Marangog ARC (Reg.-VIII)			○	IV
Silae ARC (Reg.-X)			○	IV
Kipalili ARC (Reg.-XI)			○	IV
Mat-i ARC (Reg.-XIII)			○	IV

2) Selection of Typical Model Areas

a) Criteria for Selection of Typical Model Areas

The criteria for selecting the Typical Model Areas are as follows:

- Representative of classified Model Areas
- Development potential
- Income increase and employment generating effects
- Activity of farmers' organization
- Project economy
- Accessibility to the areas

b) Selection of Typical Model Areas

The Typical Model Areas are selected considering the classified Model Areas and selection criteria mentioned above. The basic concept for selecting the Typical Model Areas are as follows;

- Considering the results of classification analyses for the 12 Model Areas by Principal Components/Cluster Methods and project development plan, the areas categorized as Cluster-1 correspond to Development Types of I, II, and III. The areas are mainly located in Northern and Central Luzon. Paddy cultivation area under irrigation water supply is relatively large with lesser upland areas. Hence, Cluster -1 area has relation with Development Types I and II,

- The areas categorized into Cluster -2 corresponds to Development Types I and III. The areas are also located in Northern and Central Luzon Upland crop cultivation under rainfed conditions are predominant, hence cluster will lead to Development Type III,

- The areas categorized into Cluster -3 corresponds to Development Types III and IV. The areas are mainly located in the Visayas and Mindanao areas. Upland crop cultivation under rainfed conditions are predominant with introduction of SALT due to limited suitable agricultural lands. This cluster will lead to Development Type IV,

- Relations between Cluster and Development Type could be concluded as follows: Development Type-I and II ARCs will be selected from Cluster-1, Development Type-III ARC from Cluster-2, and Development Type-IV ARC from Cluster-3. In case of Cluster-3, two Model Areas will be selected, since the Cluster has six ARCs.

As a result, the following four Model Areas are selected as the Typical Model Areas.

- Sappaac ARC (Reg.-CAR)
- Cofcaville ARC (Reg.-II)
- Marangog ARC (Reg.-VIII)
- Silae ARC (Reg.-X)

Feasibility study on the development of agrarian reform communities in marginal areas was conducted during the Phase-II study period fr the selected Typical Model Areas.

RECOMMENDATIONS

The items to be recommended are not only for the 12 Model Areas, for which basic development plans of ARCs were established, but also for the other areas to be established.

1. For establishing the basic development plans, prevailing natural, social and economic conditions in the areas shall be fully identified.

   - Poverty conditions,
   - Living conditions,
   - Production conditions and
   - Development potentials.

2. As the components of the development plans, the following items are recommended to be examined:

   - Improvement and enhancement plans for social and institutional capabilities,
   - Land-use and soil conservation plans,
   - Farm management and agricultural supporting service plans,
   - Water resources development plan,
   - Agricultural infrastructure plan,
   - Rural infrastructure plan,
   - Rural agro-industry plan, and
   - Environmental conservation and rural health improvement plan.

3. Based on the analyses on prevailing conditions and the studies by means of the development plans, classification of the areas was prepared and the types determined. After due consideration of the following items, the detailed development plan shall be formulated, considering the Guideline prepared by the JICA Study Team.

   - Participatory approach and institutional/social capability building of the beneficiaries,
   - Land use plan and land conservation plan on the farmland level by introducing SALT,
   - Improvement of agricultural production, agricultural extension and support,
   - Improvement of sales and marketing of the agricultural products, and establishment/strengthening of the farmer's organization,
   - Possible water resources development and introduction of small scale irrigation system, and
   - Improvement of rural living conditions

4. Since the resources producing capabilities, the services managing abilities of the farmers in marginal areas, and the social and institutional organizations by which their capabilities are activated are remarkably immature participation approach (PA) shall be needed for knowing and acquiring the technique, knowledge and attitude. Social preparation (SA) shall be implemented to solve the problems through the outside guidance. Social and institutional capabilities building plans shall include:

   - Formation of technical working group(TWG) at the local level,
   - Farmers' organization strengthening and guidance by NGOs with much experiences working near the areas concerned, and
   - Farmers' training and seminars, etc.

5. That the national government (NG) shall support the Local Government Units (LGUs) through institutional strengthening. This plan of ARC development in marginal area is related to many fields. Besides, DAR is the leading agency but only coordinating agency for project implementation based on the plan. They can handle land distribution and only coordinate the project implementation for the distributed land. The actual technical supporting can be done by DA, NIA, DPWH, DENR and others according to CARP.

   On the other hand, since the Study Areas are situated in marginal areas, LGUs will necessarily work as main support agencies. Human and material support to LGUs shall therefore be urgently provided.

6. The government budget allocation to DAR is not very much. The regular budget is limited to the necessary amount for land procurement and distribution. For financial appropriation for the development plan of marginal areas, mobilization of domestic financial resources and utilization of foreign fund in developed countries and international organizations shall be considered. It is most urgent and important task for DAR to secure necessary amount of fund for development of marginal areas.

7. The following are recommended to promote the project benefits after project implementation.

   - Promotion of community development
     For the early materialization and promotion of the Project effectiveness, governmental support services for agricultural and rural development shall be continued even after project implementation by the provincial and municipal government and NGO (hired by the project).

   - Smooth conduction of operation and maintenance activities for the project facilities.
     Actual operation and maintenance for the constructed project facilities

shall be undertaken by the municipal offices and farmers organization /cooperatives. However, close coordination are necessary, as there are various O & M activities.

- Monitoring of the implementation and project evaluation
  Monitoring and project evaluation shall be made for the project result and materialization of the project target. The Department of Agrarian Reform (DAR) as major implementing agency and the National Economic Development Authority (NEDA) as the national economic planning agency, shall participate on these monitoring and evaluation activities.

8. Detailed Items

a) As the strategy for agricultural development, in accordance with the result of the rural-agro-economic survey, the projects' requested by farmers shall be provided higher priority and lands be utilized as much as possible by converting uncultivated (unused) lands into farmlands. The target of farm income is enhancement of small farmers' farm income. It will contribute to eradication of poverty and fair economic growth in the rural areas.

b) For animal husbandry development plan, the following main measures shall be applied:

- Improvement of overall productivity of livestock by supplying sufficient number of high quality breeder stock,
- Organization of farmers' activities through training and technical extension,
- Promotion of livestock farming systems through improvement of folder crop production and introduction of intensive raising system, and
- Increasing traction animal initially followed by meat production (cattle and buffaloes).

c) For post-harvest plan, it should cover initially the introduction and distribution of equipment and facilities at the first stage.

In marketing plan, organization of farmers, infrastructure development, (especially road network improvement) leadership training, credit system strengthening, etc. shall be conducted.

d) For institutional development, support to farmers as well as development of agricultural infrastructures (access road to market), water resources development, tractor supply for reclamation of cogon land, credit system setup; technical development, extension service, seed and animal supply system shall be considered.

e) For water resources development plan, although surface water is quantitatively limited, the development of water at low cost for irrigation and

domestic water, shall be established (small water impounding dam, tank irrigation, diversion dam, etc.).

f) For drainage plan, discharging of excess water in lower lands and eradication of Schistosomiasis shall be considered.

g) For farm land conservation plan, the farm land shall basically remain at present condition/slope applying some measures for preventing soil erosion. Such protection measures are tree planting along contour lines.

h) Farm road shall be newly constructed and/or fully improved to upgrade life standard and to promote development of agriculture and related industries.

i) The water supply system shall basically be at level-I system using deep wells and springs (common deep wells and hand pumps, or common valves of intake boxes).

j) Rural electrification plan shall be established at the four marginal areas not yet energized.

k) Ecological approach to conservation-based farming systems will be rehabilitation, conservation and protection of the landscape. These components shall focus on soil conservation, rehabilitation of the forest cover and the stream corridor, and public health related to environmental conservation.

II. FEASIBILITY STUDY FOR TYPICAL MODEL AREAS

SUMMARY

C. Feasibility Study for Typical Model Areas

C. 1 Formulation of Development Plan

Feasibility Study on the selected four Typical Model Areas, Sappaac ARC (Reg.-CAR), Cofcaville ARC (Reg.-II), Marangog ARC (Reg.-VIII) and Silae ARC (Reg.-X) was carried out during the Phase-II study, in the terms of the following aspects:

- Social capability and institutional development plans
- Land use plan
- Farming and agricultural extension plan
- Water resource development plan
- Irrigation and drainage plan
- Farmers' organization plan
- Environmental conservation plan
- Physical plan and cost estimate
- Project implementation and operation and maintenance plan

The results of formulated project plan for the four Typical Model Areas are presented in Table C-1.

C. 2 Physical Plan and Cost Estimate

The physical plans for each area are made based on the formulated development plan. Its required project costs are also estimated. Table C-2 indicates the outline of these physical plan and estimated costs.

C. 3 Project Implementation and Operation & Maintenance Plan

1) Project Implementation Plan

Project implementation plan is presented in Figure C-1. The Project will be implemented on the following three stages.

- Social preparations (SP) and institutional strengthenig stage
- Facility construction and equipment supply stages, and
- Community development and operation & maintenance stages.

At the provincial level, the Provincial Project Management Office (PPMO) shall be established. It shall be composed of DAR regional, provincial offices and also local representatives of concerned governmental offices. The Chairman of the PPMO is the Provincial Agrarian Reform Officer (PARO) who shall directly be in charge of the management and operation of the Project. A Local Technical Working Group (LTWG) shall be established under the PPMO. It will support PPMO in the implementation of the Project.

2) Operation and Maintenance of Project Facilities

Operation and maintenance of the project facilities would be undertaken by the PPMO that shall be established. The PPMO shall be in charge of the planning and operation and maintenance of the project facilities. The newly established and/or strengthened municipality/barangay government, people's organization will directly conduct actual O&M activities for the project facilities under the support and direction of the PPMO. Central, regional and local offices of the concerned governmental agencies and LTWG will support this activities.

C.4 Project Evaluation

Refer to Recommendations described beforehand.

TABLE C-1 OUTLINE OF DEVELOPMENT PLAN FOR TYPICAL MODEL AREAS

1. Sappaac ARC, Bangued, Abra, CAR

a) Problems, Constraints and Development Potential

The rice land covering 84 percent of total cultivated area are located contiguously. All the rice lands are rainfed, with low cropping intensity and poor yield. There is one promising dam site where a small scale water impounding dam (SWID) can be constructed. The areas that has a slope of less than 18 percent occupies a large area. Most of these areas can be converted from idle land to cultivated land. The existing roads surrounding the Project Area are not passable by any type of vehicle. Few internal roads are available .

b) Development Plan

The surrounding roads of the Model Area shall be improved. One small scale water impounding dam shall be constructed to irrigate some rice lands, to increase cropping intensity as well as to introduce diversified crops. Farm roads between the barangay proper and sitios shall be improve and/or newly constructed to develop agricultural production in the internal area. Some portions of the Model Area would require drainage improvement and soil conservation. The major facilities proposed including agricultural development support, rural and social infrastructure are shown below:

- Road		
Improvement of access road and farm road	:	length=6.8 km
Construction of new farm road	:	length=3.3 km
- Irrigation		
Construction of new irrigation system(SWID)	:	area=30ha
- Drainage / Soil Conservation		
Improvement of drainage facilities	:	l=1.2km
Tree planting for soil conservation	:	40ha
- Agricultural development / Post-Harvest and rural industry		
Nursery	:	one
Demonstration farm	:	one
Animal breeding center and livestock dispersal	:	lump sum
Multi-purpose dryer	:	two places
Agro-industry center	:	one
- Rural Infrastructure		
Rural water supply system(Level-1, deep well)	:	nine
Health center	:	one
Barangay Multi-purpose Center	:	one

2. Cofcaville ARC, Maddela, Quirino, Region-II

a) Problems, Constraints and Development Potential

The upland covers 83 percent of total cultivated area. An average farm household cultivate about 2.2 ha. Present cultivated land occupy only 54 percent while the remaining areas are left as idle lands. The existing roads between the barangay proper and sitios are not passable with vehicles even during the dry season. A portion of the existing access road also becomes impassable by any type of vehicle during the wet season. Typhoon frequently attack the area bringing about severe hazardous crop damages. There is a promising site where a small scale water impounding dam (SWID) can be constructed that would help farm households irrigate some of their rice lands.

b) Development Plan

It is planned to improve the access road to the Model Area and all existing roads connecting the barangay proper to the sitios. Farm roads shall be constructed to accelerate the development in the internal areas along the roads. One SWID shall be constructed to irrigate some parts of rice land, to supply not only irrigation water but also for other purposes. The major facilities proposed including the agricultural development support are shown below:

-	Road	
	Improvement of access road and farm road	: length=3.8 km
	Construction of new farm road	: length=8.7 km
-	Irrigation	
	Construction of new irrigation system(SWID)	: area=6 ha
-	Drainage / Soil conservation	
	Improvement of drainage facilities (canal)	: l=0.6km
	Tree planting for soil conservation	: area=50ha
-	Agricultural development /Post-Harvest and rural industry	
	Nursery	: one
	Demonstration farm	: one
	Animal breeding center and livestock dispersal	: lump sum
	Multi-purpose dryer	: two places
	Agro-industry center	: one
-	Rural Infrastructure	
	Health center	: one
	Expansion of primary school classroom	: one

3. Marangog ARC, Hilongos, Leyte, Region-VIII

a) Problems, Constraints and Development Potential

To reach the Model Area, the farmer beneficiaries has to cross a river. Because of the absence of a bridge across the river, the area is frequently isolated during the wet season and becomes impassable to any type of transportation. All roads, including the access road as well as the roads connecting the barangay proper to the sitios are in very poor conditions. Steep and hilly lands cover about 50 percent of the Model Area. The area of land which has a slope of less than 18 percent occupy only 46 percent of the total area. The elevation from the sea level range from about 350 m to 400 m. There is a possibility to introduce the cultivation of sub-high altitude vegetables with the introduction of tank irrigation type system.

b) Development Plan

The access road shall be improved with the construction of a light type bridge as submergible crossing bridge. Moreover, some farm roads shall be constructed to intensify cultivation of present land and to convert the idle lands to cultivated lands. The tank irrigation type system shall be introduced to supply water for irrigation of sub-high altitude vegetables and other crops and for other purposes. The major facilities proposed including the agricultural development support are shown below:

- Road
  - Improvement of access road and farm road : length=9.6 km
  - Construction of new farm road : length=3.2 km
- Irrigation
  - Construction of new irrigation system : area=15ha
- Drainage/Soil conservation
  - Tree planting for soil conservation : area=30ha
- Agricultural Development / Post-Harvest and rural industry
  - Nursery : one
  - Demonstration farm : one
  - Animal breeding center and livestock dispersal : lump sum
  - Multi-purpose dryer : three units
  - Agro-industry center : one
- Rural Infrastructure
  - Rural water supply system (Level-II, Spring) : one
  - Health center : one
  - Multi-purpose barangay hall : one

4. Silae ARC, Malaybalay, Bukidnon, Region-X

a) Problems, Constraints and Development Potential

The Model Area is located near the boundary of Bukidnon. It has an elevation of more or less 550 m from mean sea level. There are two access roads from Malaybalay to the area with a total length of 17 km and 52 km. Upland field covers 95 percent of the total cultivated area, that are located contiguously along one of the major creek. Some rice land is located in the lowland along the creek. There are reported cases of schistosomiasis affecting the lowland. Corn is mainly planted not only in the gently sloping area but also in the steep hillside area without any kind of soil conservation measures. The main creek may have enough amount of water which can be tapped for irrigation purposes to grow rice and sub-high altitude crops.

b) Development Plan

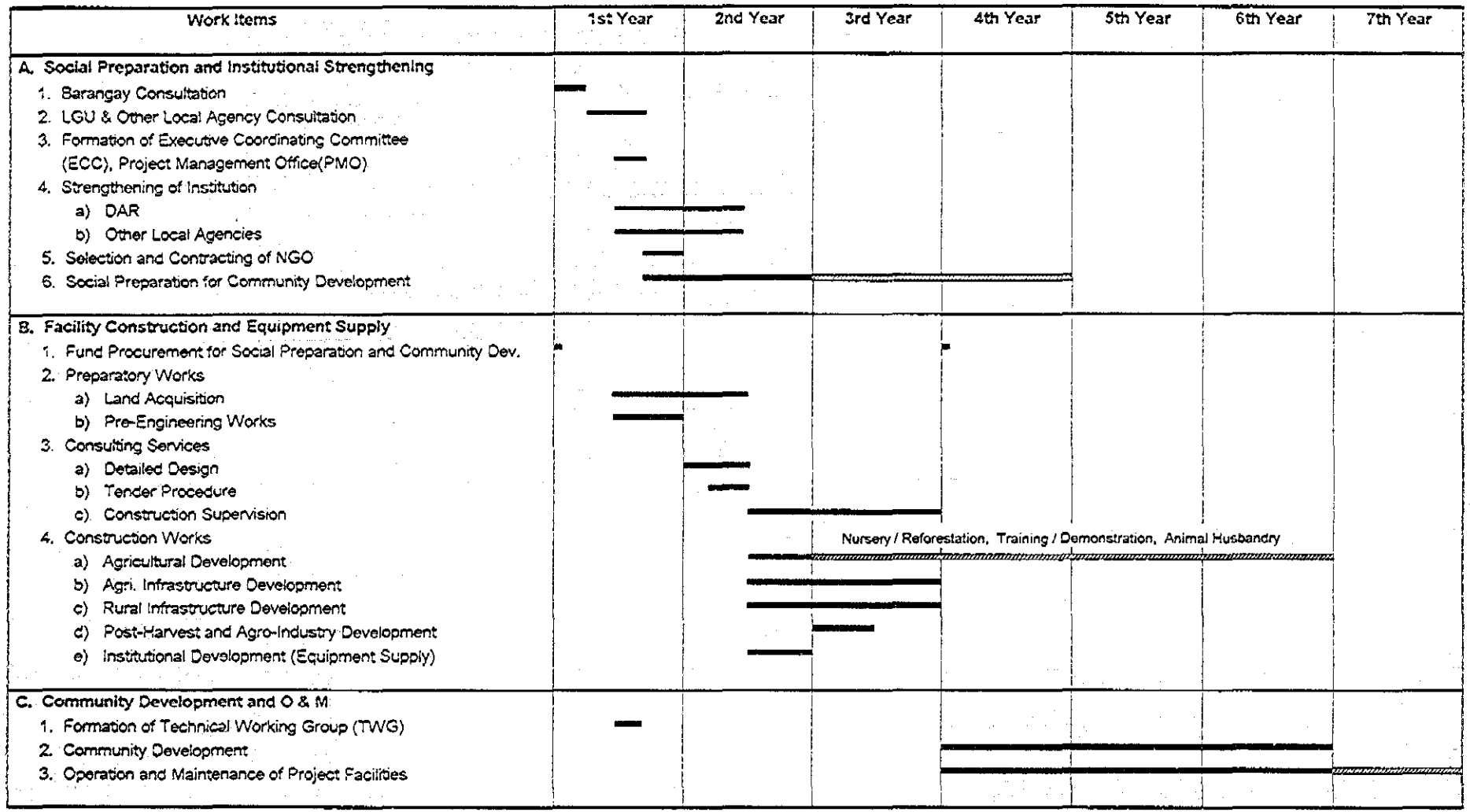
There are existing good roads between the barangay proper and sitios. However, some farm roads shall be newly constructed to intensify the land use of the existing cultivated lands and to convert the idle lands to the cultivated lands. An irrigation system may be constructed with the provision of intake in the existing creek. Drainage facilities shall be developed in the lowland. The major facilities proposed including the agricultural development support are shown below:

- Road	
Construction of new farm road	: length=2.7 km
- Irrigation	
Construction of new irrigation system(2 places)	: area=13.2ha
- Drainage Improvement of drainage facilities (canal)	
	: l=1.5km
Tree planting for soil conservation	: 20ha
- Agricultural development / Post-Harvest and rural industry	
Nursery	: one
Demonstration farm	: one
Animal breeding center and livestock dispersal	: lump sum
Multi-purpose dryer	: two units
Agro-industry center	: one
- Rural Infrastructure	
Rural water supply system (Level-I, deep well)	: five
Rural electrification	: 3.5km

TABLE C-2 PROJECT FEATURES FOR TYPICAL MODEL AREAS AND THEIR COSTS

Item	Sappaac (Region-CAR)		Colcaville ARC (Region-2)		Marangog ARC (Region-8)		Silae ARC (Region-10)	
1. Areas, Population and Farm Household								
1.1 Areas (ha)								
a) Study Areas	375		490		330		164	
b) Ratio of Area less than 18% of Land Slope (%)	70		73		46		58	
c) Proposed Cultivation Area (lessthan 30%)	263		358		152		95	
1.2 Population								
a) Total Population	1,159		1,326		1,309		564	
b) Farm Household	189		179		247		115	
Permanent	179(95%)		55(30%)		238(96%)		3(3%)	
Transient	10		124		9		112	
1.3 Proposed Main Crop	Paddy Rice + Upland Crop(Garlic)		Paddy + Paddy + Upland (Mungbean)		Paddy Rice + Upland (Squash)		Paddy + Paddy + Upland (Mungbean)	
2. Agricultural and Rural Infrastructural Facilities	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
2.1 Construction Costs		(P'000)		(P'000)		(P'000)		(P'000)
a) Agricultural Development								
1) Nursery	0.05 ha	161	0.05 ha	161	0.05 ha	161	0.05 ha	161
2) Training & On-farm Demonstration Farm	1 place	195	1 place	195	1 place	195	1 place	195
3) Livestock Dispersal	15 heads	300	15 heads	300	15 heads	300	15 heads	300
4) Animal Breeding Center	50 sq.m	215	50 sq. m	215	50 sq.m	215	50 sq.m	215
5) Poultry Incubator	1 unit	80	1 unit	80	1 unit	80	1 unit	80
Sub-Total		951		951		951		951
b) Agricultural Infrastructure Development								
1) Irrigation Development	1 SWID	5,635	1 SWID	2,794	1 Intake	6,859	2 Intake	3,433
2) Drainage Improvement	1,200 m	299	600 m	165	-	-	1,480 m	899
3) Farm Roads Development	3.3 km	5,750	8.7 km	12,914	3.2 km	6,398	2.7 km	5,075
4) Farm Land Conservation	-	-	-	-	-	-	-	-
Sub-Total		11,684		15,873		13,257		9,407
c) Rural Infrastructure Development								
1) Rural Roads Development	6.8 km	11,513	3.8 km	8,872	9.6 km	17,581	LS	600
2) Rural Water Supply Development	9 places	2,160	-	-	1 place	1,450	5 places	1,200
3) Other Social Infrastructure	LS	500	LS	460	LS	430	LS	1,430
4) Rural Electrification	-	-	-	-	-	-	3.5 km	1,050
5) Strengthening Motor Pool for O & M works	LS	15,000	LS	15,000	LS	15,000	LS	15,000
Sub-Total		29,173		24,332		34,461		19,280
d) Post-Harvest & Agro-Industry Facilities								
1) Agricultural Machinery	LS	33	LS	1,545	LS	56	LS	51
2) Post Harvest & Agro-Industry Facilities	2 places	2,593	2 places	4,327	2 places	1,630	1 place	2,233
Sub-Total		2,626		5,872		1,686		2,284
e) Institutional Development								
1) Community Development Program	1 place	670	1 places	670	1 place	670	1 place	670
Sub-Total		670		670		670		670
TOTAL		45,104		47,698		51,025		32,592
2.2 Community Development & Support Services	LS	3,842		3,842	LS	3,842	LS	3,842
TOTAL		3,842		3,842		3,842		3,842
2.3 Associated Costs								
a) Pre-Engineering Cost (5% of 2.1)	LS	2,255	LS	2,385	LS	2,551	LS	1,630
b) Administration Cost (10% of (2.1+2.2))	LS	4,895	LS	5,154	LS	5,487	LS	3,642
c) Consulting Services (refer to Table N 2-13)	LS	7,104	LS	7,104	LS	7,104	LS	7,104
TOTAL		14,254		14,643		15,142		12,376
2.4 Land Aquisition	LS	528		1,016		366		498
TOTAL		528		1,016		366		498
2.5 Physical Contingency (10% of 2.1+2.2)		4,895		5,154		5,487		3,643
GRAND TOTAL		68,622		72,353		76,861		52,951
2.6 Total Project Costs for Four Typical Models	269,787							
3. Project Evaluation (EIRR,%)	12		12		9		19	
4. Classification of Model Areas								
3.1 Classification of Model Areas								
a) By Various Elements of Present Conditions	Cluster-1		Cluster-2		Cluster-3		Cluster-3	
b) By Project Development Type	Type-I, II		Type-III		Type-IV		Type-IV	

FIGURE C-1 IMPLEMENTATION SCHEDULE FOR THE PROJECTS



RECOMMENDATIONS

1. Feasibility of the project implementation

   Implementation of the Projects for the four Typical Model Areas selected from 12 marginal areas through the Master Plan Study will contribute to the improvement of the depressed farm conditions, increase farm income and minimize financial disparity in the surrounding villages. Furthermore, as a result of the project evaluation, the internal rate of return, indicating feasibility of the Project, are 12 percent in Sappaac and Cofcaville Areas, 9 percent in Marangog Area and 19 percent in Silae Area. The Project is considered as feasible, technically and economically considering the urgency and priority of the implementation as described below, though figures for Marangog Area seems rather lower.

2. Urgency and priority of the project implementation of the Typical Model Areas

   Since the four Typical Model Areas represents each types of ARC by means of present conditions and development plans, the implementation of the projects in these Model Areas will be the pilot models for hundreds of similar marginal ARC. It will provide wide effect and impact not only to the surrounding area but also the province and region. It is therefore necessary that the projects in these four Model Areas be implemented urgently with high priority.

3. Formulation of project plan for remaining Model Areas

   In the feasibility study mentioned above, the study the four Typical Model Areas were undertaken by the Study Team. However, the studies for the remaining other Model Areas are recommended to be undertake using the Guideline prepared by the Study Team.