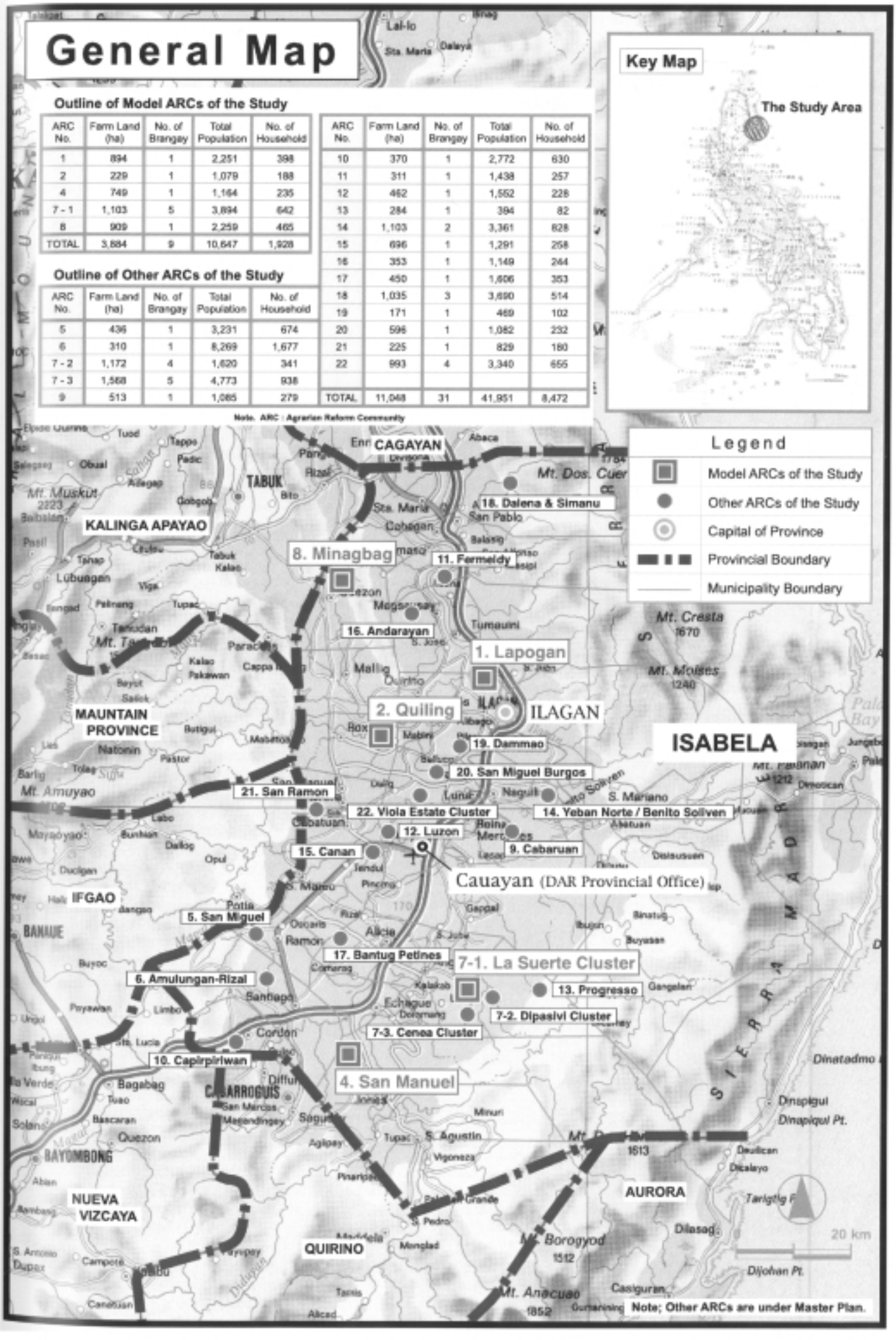
Part 2
Feasibility Study

General Map



Outline of Model ARCs of the Study

ARC No.	Farm Land (ha)	No. of Brangay	Total Population	No. of Household
1	894	1	2,251	398
2	229	1	1,079	188
4	749	1	1,164	235
7 - 1	1,103	5	3,894	642
8	909	1	2,259	465
TOTAL	3,884	9	10,647	1,928

Outline of Other ARCs of the Study

ARC No.	Farm Land (ha)	No. of Brangay	Total Population	No. of Household
5	436	1	3,231	674
6	310	1	8,269	1,677
7 - 2	1,172	4	1,620	341
7 - 3	1,568	5	4,773	938
9	513	1	1,085	279
10	370	1	2,772	630
11	311	1	1,438	257
12	462	1	1,552	228
13	284	1	394	82
14	1,103	2	3,361	828
15	696	1	1,291	258
16	353	1	1,149	244
17	450	1	1,606	353
18	1,035	3	3,690	514
19	171	1	469	102
20	596	1	1,082	232
21	225	1	829	180
22	993	4	3,340	655
TOTAL	11,048	31	41,951	8,472

Note. ARC : Agrarian Reform Community

Summary of five (5) Model ARCs/Cluster

	Items	Quiling	Lapogan	Minagbag	San Manuel	La Suerte
1	ARC Estabulished in	1993	1993	1994	1993	1993
2	Gross Area (ha)	240	993	3,952	1,519	1,935
3	Population in 1995	1,079	2,251	2,259	1,164	3,864
4	Municipality	Roxas	Tumauini	Quezon	Echague	Agadanan
5	No. of HH	188	398	465	235	642
6	Total Farm Land (ha)	229	894	909	749	1,092
7	Area Category	Prime Agri.	Developing A.	Developing A.	Developing A.	Marginal A.
8	Geographic Condition	Almost Flat	Almost Flat	Mixture	Mixture	Almost Hilly
9	Possibility of Irri. Development	No	Yes	Yes	No	No
10	Current Irri. Condition	Fully Equip'd	Not Fully Equip'd	Not Fully Equip'd	No	No
11	LTI (%)	100	100	90	82	100
12	Strategic Vitality of MPCI	High	High	Low	High	High
13	Current Condition and Motion of MPCI	Upward	Upward	Upward	Upward	Upward
14	Cultivated Area (Paddy Field - ha)	151	95	467	300	193
15	Cultivated Area (Corn Field - ha)	69	460	400	400	882
16	Cultivated Area (Others - ha)	9	339	42	49	17
17	Soil Type	Clayey loam	Sandy Loam	Clayey loam	Clayey loam	Clay
18	Average Farm Size (ha)	1.2	2.2	2.0	3.2	4.3
19	Present Total Palay Production (MT)	1,419	348	3,586	1,130	1,208
20	Present Total Corn Production (MT)	501	3,450	3,020	1,680	6,439
21	Irrigated Area (ha)	151	20	390	23	0
22	Existing Multi Purpose Solar Dryer (Sq.m)	2,500	5,040	9,900	420	2,520
23	Existing Multi Purpose Pavement (Sq.m)	4,020	4,000	200	200	1,560
24	Existing Farm Road (km)	7.0	16.0	29.0	10.0	27.9
25	Existing MPCI Established in	1993	1989	1990	1990	1995
26	- do - No. of Members in 1999	80	175	456	140	140
27	- do - Amount of CBU in 1999 (pesos)	43,000	70,000	MT 2 million	450,000	76,000
28	Major Problems: - Low Agri. Production	○	○	○	○	○
29	do: Low Quality of Farm Produce	○	-	-	-	○
30	do: Low Price of Farm Produce	○	○	○	○	○
31	do: High Production Cost of Farm Produce	○	○	○	○	○
32	do: Few Job Opportunity	-	○	○	○	-
33	Proposed Paddy Planted Area (ha)	151	325	512	300	193
34	Proposed Corn Planted Area (ha)	63	184	312	300	700
35	Proposed Mung Bean Planted Area (ha)	50	100	145	-	-
36	Proposed Vegetables Planted Area (ha)	11	-	5	-	2
37	Proposed Fruits Planted Area (ha)	-	46	33	70	90
38	Proposed Tree Planted Area (ha)	-	-	213	30	130
39	Proposed Palay Production (MT)	1,812	3,900	5,682	2,470	1,430
40	Proposed Corn Production (MT)	484	1,472	2,496	2,400	4,900
41	Proposed M. Bean Production (MT)	40	80	116	-	-
42	Proposed Irr. Facility	-	Pump	Pump	-	-
43	- Water Source	-	Cagayan R.	Padapad Cr.	-	-
44	- Gross Water Requirement in Max.(lit/sec)	-	669.5	92.7	-	-
45	- Irri. Area (ha)	-	325	45	-	-
46	- Irri. Canal Length (km)	-	8.47	1.66	-	-
47	Proposed Post Harvest Facility	16,766	50,159	63,403	35,531	36,957
48	Proposed FTMR (km)	-	-	-	-	4.38
49	Production Road (km)	3.44	8.85	8.17	8.80	8.37
50	Strengthening MPCI	K to V	K to V	A to V	V to W	V to W
51	Rural Credit Plan	MF, etc.	MF, etc.	MF, etc.	MF, etc.	MF, etc.
52	Livelihood Development Plan					
53	- Animal Disposal	○	○	○	○	
54	- Backyard Gardening	○	○	○	○	○
55	- Fresh Water Fish Culture	○	○	○	○	○
56	- Mushroom Culture	○	○	○	○	○
57	- Simple Agro-Processing					○
58	Management Capability Building Plan	5 Training Prog.	5 Training Prog.	5 Training Prog.	5 Training Prog.	5 Training Prog.
59	Total Project Cost ('000 pesos)	91,805	196,114	297,505	220,733	241,570
60	Project Evaluation (FIRR - %)	24 to 34	23 to 36	24 to MT 50	LT 15	49 to MT 50
61	- do - (EIRR - %)	23	17	15	15	41
62	Initial Environmental Examination (IEE)	EIA not necessary	EIA not necessary	EIA not necessary	EIA not necessary	EIA not necessary

Note: K - Kintaro, V - Vibrant, MF - Micro Finance, LT - less than, MT - more than
A - Anarchy, W - Area Wide Cooperative

Chapter1

Quiling ARC

Chapter 1 Quiling ARC

1.1 Category of ARC

Based on the ARC classification and clustering, Quiling ARC is categorized as follows:

Area	Geographic Condition	Possibility of Irrigation Development	Current Irrigation Facilities	LTI (%)	Strategic Vitality of Farmers Organizations: Current Condition and Motion
Prime Agriculture Area	Almost flat	Yes	Fully equipped	100	High vitality and moving upward

1.2 Present Conditions and Problems

1.2.1 Agriculture

(1) Present Condition

The total farmland is 229 ha and rice is the major crop grown in the area at about 151 ha. The planting of palay is one of the main sources of income of farmers. On the other hand, corn is grown at about 69 ha. Considering these areas are not reached by irrigation system, tobacco is rotated with corn during dry season at about two (2) ha. Soils in the ARC are clayey loam. A farmer holds about 1.2ha on the average.

Rice is grown twice a year under MRIIS irrigation system from June to October in the wet season, and from December to April in the dry season. The average yield is 80 cavans/ha in the wet season and 108 cavans/ha in the dry season, producing 28,388 cavans (about 1,420 MT) of palay in the whole ARC. The heavy damage due to RTV disease reduces the yield of palay. Direct seeding is a usual practice in the ARC. The total production cost ranges from 12,825 peso/ha (rainy season) to 20,520 peso/ha (dry season). The net income is from 9,175 peso/ha (rainy season) to 22,680 peso/ha (dry season).

Yellow corn is grown from April to September in the wet season, yielding 63 cavan/ha on the average, and from November to March in the dry season, yielding 84 cavan/ha. White corn is planted under a contract with a vender. The ARC produces 10,017 cavans (about 500 MT) of corn. Some farmers grow tobacco in the dry season,

and some of them do it under a contract with a Lancaster, a private company who provides farmers with input in a low interest rate at seven (7) % per cropping. Vegetables and fruit trees are grown at the backyard, and the string bean, egg plant and bitter gourd can be sold to the local market. A farmer grows onion and garlic intensively, gaining good money. Animals are kept in a small scale, 190 Carabaos, 31 cattle, 50 pigs, and unaccountable number of chickens and ducks in the ARC. Main farm products in this ARC are as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Total (cavan)	Total (MT)
Rice	151	151	80	108	12,080	16,308	28,388	1,419
Corn	69	67	84	63	5,796	4,221	10,017	501
Tobacco	0	2	0	1.5MT	0	3MT		3

(2) Problems

The farmers suffer from pests and diseases such as RTV disease, snails on rice, corn borer and downey mildew on corn, army worm on tobacco, etc. The yield of both rice and corn is low. And there is no road in the farmland. This situation resulted to high cost in the hauling of palay from the farm at 20 peso/cavan. Hence, most of the farmers in the ARC are tied-up with private traders. In addition, there are scarce opportunities for the ARCs for off-farm income.

1.2.2 Agriculture and Rural infrastructures

(1) Present Conditions

a) Irrigation System

Out of the total farmland area of 229 ha in Quiling ARC, about 151 ha is irrigated by the North main canal from Siffu Dam, a part of the Magat River Integrated Irrigation System (MRIIS). The length of main canal that runs through the ARC is 9.2 km. This main canals and lateral canals are under the management of MRIIS District III Office. The farm ditches are managed by the Irrigators' Association (IA) established by the farmer's beneficiaries in Quiling ARC. In the National Irrigation System (NIS), the beneficiaries have to pay water charges for operation and maintenance of the water as well as the canals. The charges from the farmers are collected by IA and paid to NIA. As of June 2000, repairing works of the major structures such as checks and division works, etc on the northern main canal had been performed.

b) Post Harvest Facility

The post harvest facilities available in the ARC are solar dryers as shown in the following table. DAR constructed the multi-purpose solar dryer located beside the Barangay Hall.

Present Conditions of Post Harvest Facilities (Quiling ARC)

Facilities	Size	Area
Multi-purpose drying facility	50m x 50 m	2,500 sq.m
Multi-purpose paving facility	804 m x 5 m	4,020 sq.m

There is neither a warehouse nor a mechanical dryer in Quiling ARC.

c) Farm to Market Road

From the center of the municipality to Barangay Quiling, the distance is about seven (7) km by way of the Santiago-Tuguegarao national road and the operation and maintenance road for the Siffu northern main canal. In the ARC area, the road is either for general use in the living area or for farming in the rural area. The farmland is located north of the main canal, surrounded by two (2) farm roads running from north to south. These roads run through end of the Barangay with the distance of 1.3 km.

(2) Problems

Although the irrigation system has been fully installed, sometimes the period for the growing of rice and the time of supply of required water do not correspond. As a result, crop production may not come up to the expected production.

The shortage of post harvest facilities has compelled farmers to sell the crop without any treatment, resulting to reduction of income by about 2.0 peso/kg.

A farm road in the east side of the main canal has the same altitude as farmland, and is not passable in the rainy season. Therefore, the palay in the rainy season may not be timely harvested due to the difficulty to bring the thresher in the field. If not harvested within the period of one week, the quality of the palay deteriorates and its price comes down. Even when the thresher is carried into the farmland at high expenses, transportation of the produce has to depend on lots of labors through the long, muddy and soft paddy field. The shortage of passable and good farm road has therefore invited the higher production cost of crops.

1.2.3 Farmers' Organization

(1) Present Situation

Quiling MPCI was established in 1993 and the MPCI was still young. During the period from 1995 to 1996, the MPCI was sluggish. It was in 1997 when the new MPCI leader was selected and started the action for revitalization. Accumulated CBU became 6 times higher at 43,000pesos now compared with 1994 level at 7,200pesos. During the period, initial members multiplied 4 times in slow tempo, accounting for 80 at present. The increase of members has coincided with the restructuring of cooperative in 1997 when the loan from DAR's livelihood project has been delivered[1] to 22 members. Although the capital share contribution at harvest time is defined at 200 pesos, latest collection rate is very low at 22 %. The reason for this low rate seems to be attributable to 1) low incentive for fee collector, and 2) prevailing "wait & see attitude" of members. The MPCI is positioning in "Kintaro" in DCC analysis.

The actions taken in restructuring stage in 1997 were as follows:

a) Forming network with NFA

The cooperative has started selling palay to NFA since 1998. The deal with NFA was concluded when the coop president at present has participated in NFA's seminar, and 30 members are joining presently. NFA's purchasing price is 9.75 pesos/kg at wet season palay (class B) and 11 pesos/kg at dry season palay (class A), respectively[2]. When Quiling MPCI sell the product, they hire a 7-tons truck at five (5) pesos/cavan rent.

b) Introduction of Birthday Regalo system

The system has been implemented during the period of 1997 and 1999. The coop members celebrate a member's birthday by giving five (5) pesos each and this gift is added to the celebrant's CBU. The reason why this system is not working at present is that there is no incentive for the money collector, and consequently it is impossible to gather expected gifts. The cooperative is now discussing the possibility of resuming this system by collecting ten (10) pesos gift and disbursing 10 % of collected amount to the collector. By doing this, the money collector will be able to get 6,320 pesos of commission. This amount deems to be sustainable motivation for the collection of gift.

c) Introduction of incentives for coop officials

To sustain the motivation, the cooperative has been discussing about 500 to 1,000 pesos of incentive to coop officials, however due to low collection rate of CBU, this idea was not realized.

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[1] DAR has provided a total of 1 million pesos and it has been shared by neighboring Barangay named San Placido. In Barangay Quiling, a total of 550,000 pesos were loaned to 22 members and invested to cow and pig fattening. This loan aimed to increase the coop members, so that membership fee and initial payable CBU will be included in the initial loan amount. Accordingly, the borrowers automatically become members. The debt was payable in 6 months, and the borrowers are asked to submit land title and livestock as collateral.

[2] The purchasing price of coop's palay includes 0.5 pesos/kg of Angat Pinoy and 0.25 pesos/kg of coop incentive, both are subsidized by the government.

d) Forming network with CAVALCO

The cooperative got a membership with CAVALCO in 1997. The officials are giving a good appraisal to DAR-CAVALCO joint training because it is free of charge, but they have not yet been able to get the opportunity of training equally to coop members due to the limited number of trainee accepted by them.

e) Construction of 420 sq.m solar dryer by CARP fund

This solar dryer was constructed in 1998 by CARP fund. It should have been constructed when ARC was formed, however it has taken five (5) years for DAR to approve the plan.

f) Establishing crop owned sari-sari store

Established in March 2000, the sari-sari store is making good sales. Coop members get a 10 % discount.

The cooperative has 7,822 pesos of deposit in FICO bank as of July 2000, but most of the CBUs are being reloaned to members. The relending conditions are as follows:

Table 1-2-1 Condition of Livestock Dispersal Loan in Quiling MPCI

Per member loaned amount	2,000 pesos
Total loaned amount	160,000 pesos
Number of loan recipient (per cycle)	8 members
Interest rate	12 % per annum
Due term	3 months
Collateral	Livestock/real estate property right (including land title)
Repayment manner	Payable every 3 months

The coop officials at present were elected in April 2000. The officials are uniting strongly and this is the reason why the cooperative shows high "Strategic Vitality" in DCC. Further, the officials are continuously paying CBU in spite of delinquency of other members. This sincere attitude is fostering centripetal force among the cooperatives.

(2) Problems

a) Imperfect rule administration

Although the necessary by-laws and policy are consolidated, only Board of Directors (BODs) are obeying them. This seems to constitute to the reason of slow accumulation of CBU. Also, the incentive for collector and the penalty for non-payment of duties are not yet ruled.

b) Wait & see attitude

Wait & see attitude is prevailing[3] and hindering the introduction of new technology and cropping pattern. This attitude usually can be seen primarily on ARCs with fair irrigation facilities and road network. Differed from other socio-cultural background, the application of training and seminar is not so effective to change this attitude.

c) Insufficient training application to coop members

Quiling MPCI is a member of CAVALCO and various training programs are being applied. However, these programs are focusing mainly on coop officials but not on members. This fact might be attributed to the low vitality of coop members, as opposite to officials. For instance, PMS and credit management training conducted jointly with DARPO was applied only on one-of-ten basis.

1.2.4 Rural Economy

(1) Present Situation

The immigrants from lower and upper Tagalog, and Pampanga composed the villagers of Barangay Quiling. The mixture of tribes makes it difficult in uniting villagers. Among these tribes, Tagalog is playing an important role in Barangay operation. The Barangay economy was lifted since NIA constructed irrigation facilities (NIS) in 1966. The ARC is composed of only one Barangay named Quiling with 1,079 of population and 188 farm household (of which 13 % is ARC). Average landholding area is 1.2ha. The farmers sell the product to private traders in the following conditions:

Product	Wet Season	Dry Season
Palay	5.5 pesos/kg (private traders)	8.0 pesos/kg (private traders)
Corn	5.0 pesos/kg (private traders)	7.0 pesos/kg (private traders)

The printerview, the debt of typical farm accounts for 8,000 pesos/cropping, or approximately 40 % of total production cost. Most of the borrowed money from private lenders is spent for purchasing farm inputs. Typical farm owners feel anxious when they owe debt exceeding 30 % of farm income at 78,240 pesos.

(2) Problemoduction cost of (wet), (dry) palay, and corn per cropping is established at 12,825 pesos, 20,520 pesos and 17,235 pesos, respectively. The breakdown of production cost shows that the fertilizer for dry season palay accounts for biggest percentage at 41 %. Hauling cost from farm to Barangay that arises due to ill accessibility is 20 pesos/cavan accounts for 7 % of the total production cost.

[3] The result from workshop conducted by JICA Study Team.

Typical farm defined for the farm budget analysis is palay production farm who owns 1.2 ha of land with irrigation facility. The annual income of typical farm is estimated at 84,000 pesos, which consists of 78,240 pesos of farm-income, 5,500 pesos of off-farm income, and 260 pesos of non-farm income, respectively. According to the

Typical farm is accruing 93 % of total income from palay production and a total of off- and non-farm income accounts only for 6,000 pesos. Since the time of income generation is seasonal concentrating to planting and harvesting seasons, the farm budget has no durability toward unforeseeable expenses. The farmers can not help depending on private lenders under this situation.

1.2.5 Problems of Supporting Systems and Operations

The Barangay Agrarian Reform Committee (BARC) was established in 1987 and has been active only in mediating and conciliating land dispute problems. No other activities have been carried out by the BARC. This means that the BARC does not function as it is designated, particularly for discussing the supporting services required by the Barangay people and coordinating and managing the projects at the Barangay level. This should be one of the key problems why the supporting services cannot meet the needs of the farmers.

The Barangay Development Plan (BDP) was prepared in 1997 initially by the Barangay officials with the help of the DF. There were no representatives from the municipal office. The ARC Development Plan (ARCDP) was also prepared in the same year initially by the same group. This means that the same group prepares two different development plans, one for the LGU and another is for the DAR, which could be integrated into one plan.

Besides the DF, the agency representatives recently visited the Barangay were only a few; a) the DA-LGU[4] officer(s) who often conducted farming skills trainings and supplied agriculture inputs, and b) the municipal officer(s) who visited when infrastructure projects were implemented. This shows the supports from the agencies are very limited.

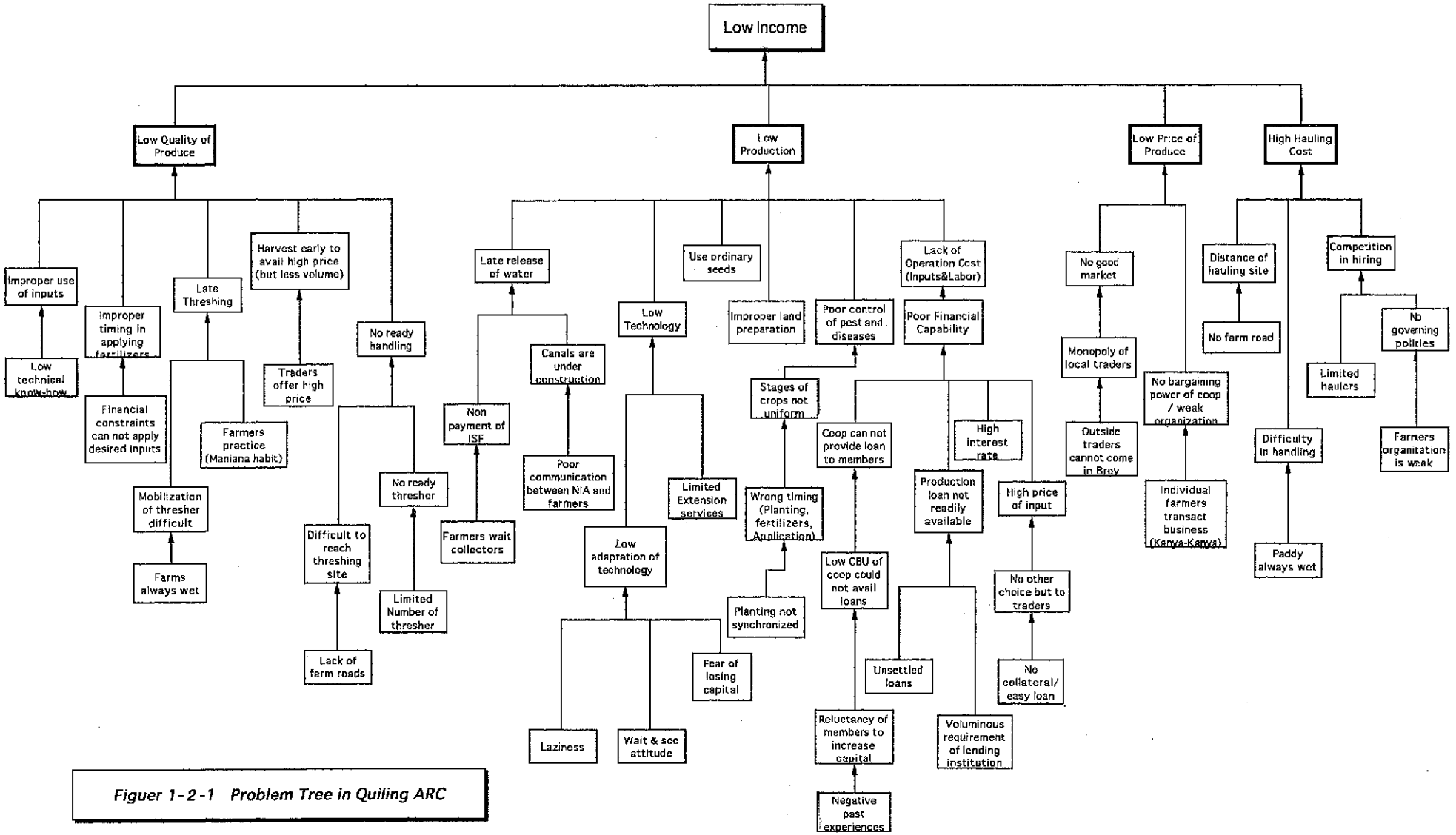
At the municipal level, the Municipal CARP Implementing Team (MCIT) was newly organized in 1998 when the present MARO took office. The MARO once presented a revision of the activity plan at the MCIT, but since then no meeting was held.

[4] This is based on the information from the Barangay officials. It is usually hard for them to identify whether those officers belong to the DA or the LGU.

This means that the MCIT does not function as it is designated, particularly for coordinating and facilitating the support services at the municipal level. Like the BARC, this should be one of the key problems why the supporting services are not effective to the beneficiaries.

1.2.6 Results of Workshop

The problem tree prepared through the workshop with the Barangay people is shown in Figure 1.2.1. The direct causes of low income identified are; a) low quality of the products, b) low production, c) low price of the products and d) high hauling cost.



Figuer 1-2-1 Problem Tree in Quiling ARC

1.3 Diagnosis of Organizational Culture

(1) Positioning of Organizational Vitality on Quiling MPCI

a) Result of DCC

Among the 22 MPCIs to which DCC has been applied in the Study Area, Quiling MPCI is positioning "Kintaro Candy" field that has high "Strategic Vitality" and low "Organizational Vitality" as its character. This culture indicates that the MPCI members are being instructed by the specific influential persons, and are feeling sense of tightness towards the management. These influential persons are seemingly to be the existing BODs, because DCC illustrates that only BODs are positioning "Kintaro Candy" field, while the vitality of MPCI members is locating to "Anarchy" field.

The vitality of MPCI officials belongs to "Vibrant" field, which shows degree both in "Strategic Vitality" and "Organizational Vitality". The leadership of the MPCI officials seems to be high, but the leadership enforced under the condition of the lack of "Appropriate Regulation" is improper even though the members are feeling that the officials have a low degree of "Tolerance of Failure" (broad heart toward failure). The problem of non-payment of debt is obviously attributed to this attitude of the MPCI officials. Accordingly, it is assumed that even though superior leaders with strong leadership will come out, the qualifications of leaders are affected heavily by the rural customs and his talent does not take effect without "Appropriate Regulation".

b) Result of movement survey

The MPCI's movement is showing "upturn". By renewing the MPCI officials, the organization is revitalizing. However, as pointed out above, it remains a risk for the MPCI to go in a wrong direction in case the officials, even though they are respected, are led by the rural customs due to lack of proper rules.

The organizational upturn is verified in the following facts:

i) The MPCI is superior in the sense of efficient procedure, process, and speedy actions toward the request from DARPO and JICA Study team.

ii) The presentation of officials is theoretical, fair and careful toward interviewers.

iii) The members are governed stringently, and all of them are MPCI in dialogue and practice Bayanihan.

c) Historical change

The major tribes composed of the Barangay are Ilocano, Tagalog, and Kalinga. It is said the complex mixture of tribes hinders unification and there are still considerable conflicts especially between Ilocanos and Tagalogs. By early 70s, the Barangay was a part of Hacienda so that the elders are said to be still conservative. The ARC's superior management was awarded in 1999, thus the high appraisal might be given to former BODs in the farmers' organization, in the sense that they have been governing complex ethnic groups in proper manner.

(2) Direction from "Kintaro Candy" to "Vibrant"

The scale of Quiling MPCI has been slowly expanding both physically and economically. The MPCI has been staying "Kintaro Candy" field since the reorganization in 1997. To shift to "Vibrant", the MPCI needs the following directions.

a) Introduction of fair rules as for payment of CBU.

b) Stimulation of "wait & see attitude" for the members.

c) Strengthening of prevailing sales activities to NFA[1] to increase more incentives to the members.

In these directions, technical assistance as well as continuous training to minimize hampering of business activities are necessary[2], especially in the process of b) and c) stated above. As shown in "6.8.2 Farmers' Organization Strengthening Schedule" in the Master Plan, Quiling MPCI needs a total of seven (7) years to shift to "Vibrant" field. For details, the consolidation of policies and the improvement of "wait & see attitude" require two (2) years, and the accumulation of CBU up to 500,000 pesos needs another five (5) years.

[1] Compared with selling palay to NFA, it is estimated that selling it to Manila can obtain higher profit. The estimation was came out from the comparison of forecasted business model taking into consideration the NFA's small possibility to purchase palay stably that is sustained by the subsidization at present.
[2] To achieve this, the business consultant proposed in the master plan will shoulder the role. The business consultant should advise to the cooperative continuously until the cooperative forms market network on palay trading and finds out new business lines.

1.4 Agriculture Development Scheme

1.4.1 Agriculture Development Plan

Since the paddy is equipped with irrigation system, it is planned to increase the rice yield without changing the rice growing area. Three (3) types of training to farmers are necessary to improve their productivity: a) training on RTV disease control by RCPC and extension workers b) hybrid rice extension by PhilRice for the whole season and, mung bean introduction. After the social preparation activities for the ARC is completed, training on RTV control will be conducted immediately. Hybrid rice will be grown at five (5) % of the paddy in the Short Term, ten (10) % in the Medium Term and 25 % in the Long Term. Mung bean will be introduced to 1/3 of the paddy in the Short Term. Rice is targeted to yield 120 cavan/ha with the extension of the above-mentioned farm technologies.

Tobacco will be grown as it is. However, for corn, it will be replaced to planting of vegetables, at 20 % of the total cornfield, which are 12 ha totally. The crop diversification will proceed five (5) % of the cornfield in the Short Term period, ten (10) % in the Medium Term period, and 20 % in the Long Term period. Farmers shall be trained practically on crop diversification at a demo-farm for a season long crop by extension workers and CVIARC. IPM and INM training was conducted already and it should be followed by an assistance of an agricultural extension worker who will put such training into practice. The farm production at the end of the Long Term Development period is as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Total (cavan)	Total (MT)
Rice	151	151	120	120	18,120	18,120	36,240	1,812
Mung bean	0	50	0	0.8MT	0	40MT	-	40
Corn	63	58	80	80	5,040	4,640	9,680	484
Tobacco	0	2	0	1.5MT	0	3MT	-	3
String bean	3	0	0.5MT	0	1.5MT	0	-	1.5
Egg plant	3	3	9MT	9MT	27MT	27MT	-	54
Water melon	0	3	0	15.3MT	0	45.9MT	-	45.9
Peanut	0	3	0	2.0MT	0	6MT	-	6

1.4.2 Post Harvest Facility Development Plan

(1) Objectives

To solve the present problems, which the sale price of palay and corn and the income of the farmers are low due to the shortage of the drying facilities, it is proposed that solar

dryers, multi-purpose solar dryers, multi-purpose pavement and warehouse with solar dryers be constructed in the ARC. The proposed project will enable the farmers to choose the time of sale of their crops.

(2) Facility Plan

The facility will have the capacity to dry a part of crop produced within the ARC area. The amount of produce to be stored shall be 20 % (4,632 cavans) of the total proposed production. The proposed floor area of the warehouse will be 140 sq.m. Grains to be stored in the warehouse will be dried at the attached drying facilities for long storage. About 75 % of the stored amount (15 % of the total production amount) will be dried at the solar dryers. A mechanical dryer will dry the rest, and its capacity is 30 cavan/day.

The proposed plan of the drying facilities is shown as follows. (for details, refer to Appendix F)

In-charge	Drying method	Ratio (%)	Planned drying amount (cavan)		Area (sq.m)
			palay	corn	
Private	back yard garden	15	2,718	756	2,647
Barangay	multi-purpose solar dryer	65	11,718	3,275	11,472
Cooperative	solar dryer	15	2,718	756	2,647
	mechanical dryer	5	906	252	-
Total		100	18,120	5,040	16,766

The multi-purpose solar dryer would be proposed at the site of the Barangay's 1.5 ha space to the south of the Barangay Hall.

(3) Implementation Schedule

Considering the progress of activities of the capability building of MPCI and Barangay officers, the construction of the drying facilities will be carried out in the following schedule.

For solar dryers in the private gardens, no specific schedule has been made since this belongs to private property. However, the construction may be completed within the period of the short or middle term development stage.

The post harvest facilities that will be managed and maintained by the Barangay will start in the second (2^{nd}) year of the short-term development stage and be completed during the short/middle term development stage. This schedule will commence after the improvement of capability of the Barangay officials, the progress of the ratio of irrigation area and the

development of agriculture. Both solar dryers and multi-purpose solar dryers included in the Barangay Development Plan (BDP) would be constructed at a comparatively earlier stage in the short-term development period.

The warehouse (including the solar dryer and a mechanical dryer) shall be managed and operated by MPCI. The construction of the facility shall commenced after MPCI has accumulated a CBU of over 200,000 pesos. Therefore, the project will be carried out during the middle term development stage.

1.4.3 Farm to Market Road (FTMR) Development Plan

(1) Objectives

The objective of the FTMR development plan is to raise the income level of farmers by improving the existing road system.

(2) Road Plan

Applying the criteria presented in 6.1.4, Chapter 1, the following roads would be proposed at the locations prepared for the purpose. The length of proposed roads is shown as follows. (refer to the attached drawing)

Road Name	Length
Road Q1	927,97 m
Road Q2	616,50 m
Road Q3	1,900,00 m
Total	3,443.53 m

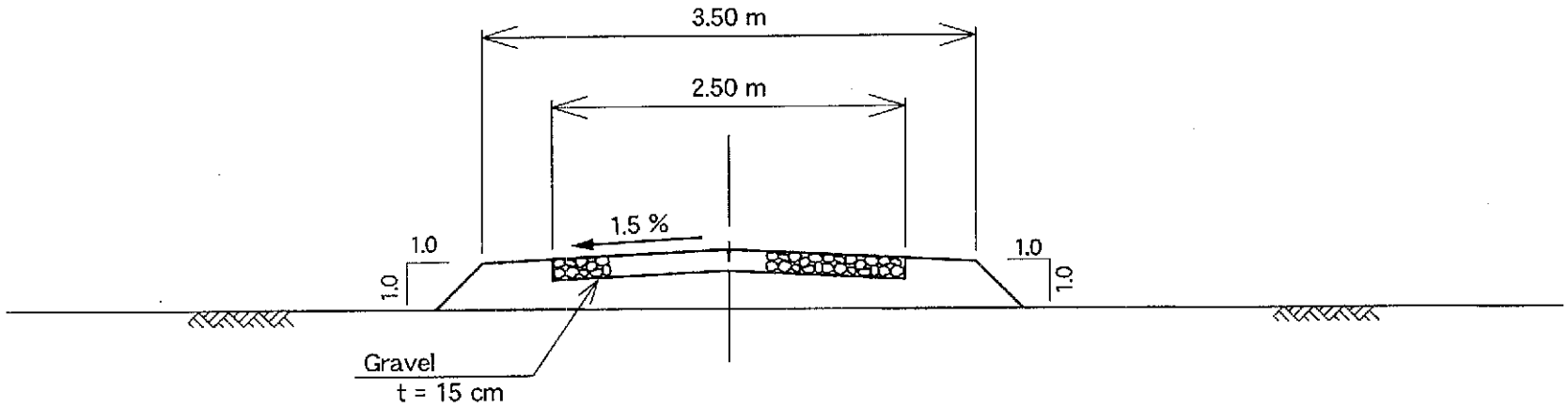
Among the existing roads, those in the east (Q1, Q2) have altitude lower than that of the farmland. As these roads are now not passable in the rainy season, the surface level shall be raised to make it passable in both dry and rainy seasons. Road Q3 is newly proposed that will cross the farmland. This will reduce the cost for the transportation of the crop. It has a width of 2.5 m covered with gravel with road shoulder of 0.5 m on both sides. (refer to Figure 1.4.1 and the section of 6.1.4 in Chapter 1 of this report.)

(3) Implementation Schedule

The farm road will be under the management of the LGU. The capability building program of the LGU will start in the first (1st) year of the short-term development period. Consequently, the management capability of the Barangay officials for construction

management is expected to improve in the second (2nd) year. The construction of the farm road, therefore, will start in the second (2nd) year at the rate of 1.0 km a year.

Figure 1-4-1 STANDARD DRAWING OF FARM-TO-MARKET ROAD



Production Road

1.5 Farmers' Organization Development Scheme

(1) Objective

The objective of development is to increase organizational vitality of Quiling MPCI from "Kintaro" to "Vibrant".

(2) Contents

1) Introducing of clear rule to the MPCI and establishing an incentive system for fee collector will be accomplished. Then, incorporation of these rules to the existing MPCI policy will be made.
2) Conduction of inspection tour to the advanced MPCI nearby the area (Epiphany MPCI is preferable) to improve members' "wait and see" attitude is prioritized and repeating of this kind of event in order that members can sustain their consciousness is necessary.
3) Introducing of a new project will be carried out when the accumulative CBU exceeds 200,000 pesos. Palay trading project is suitable. A 7-ton truck will be rented to the MPCI in order to bring produce to Manila. The MPCI will procure working capital for the project by submitting members' collateral.
4) Thus, the MPCI will gradually expand the business.

(3) Schedule

Component	Description	Outputs/Returns	Agency	Conditions to be implemented
<Short Term Development Plan>				
Revision of co-operative by-Law	Including policy on loan repayment	Formulation of coop regulations	DAR,NGO	Under Implementation
Establish small projects for coop's incentives.	Palay Trading	Strengthen "Strategic Vitality"	DAR,NGO	Non-farm income generation carried out by Verification Project
Increase member and expand coop size	Promotion campaign	Increase CBU toP200,000		
<Medium Term Development Plan>				
Increase member and expand coop size	Promotion campaign	Increase CBU toP500,000		
<Long Term Development Plan>				
Increase member and expand coop size	Promotion campaign	Increase CBU toP1,000,000		

(4) Support System

To strengthen management capability, the following training should be applied.

1) Leadership training for the MPCI officers by DAR (2 persons x 2 weeks x 2 years)
2) Skill up training on accounting, auditing, and bookkeeping by CAVALCO (3 persons x 1 week)
3) Credit management training for members by DAR (80 members x 1 day)

1.6 Development Support Scheme

1.6.1 Rural Credit Plan

The MPCI should accelerate the stock of CBU at 200,000 pesos in first five (5) years of Short Term Development period. Since the MPCI has a re-lending scheme at present, it is recommended that the expansion of loan ceiling should not be made. After the CBU will be accumulated to 200,000 pesos, the MPCI should apply for a low-interest loan from the government institutions. The MPCI should put a target to accumulate 500,000 pesos of CBU within Medium Term Development period.

Microfinance (MF) will be applied to the segment whose income decreases by the development. Especially, it is recommended to implement this scheme by Diocese of Isabela Province toward Cursillo which consists of those carrying farm produce to Barangay at present, because they seem to reduce income by the construction of a farm-to-market road. Further, MF should be provided to female organizations (Quiling RIC) in order to establish a business on simple food processing. Primarily the NGOs should carry out this MF. It is recommended that the first step which requires a little amount of fund will be started by BIDANI, and then transfer the donor to CAVALCO after each member loan exceeds to 15,000 pesos that resulted from the good achievement on loan payment by the organization.

1.6.2 Livelihood Development Plan

Livelihood development plan in this ARC includes livestock & poultry development, backyard gardening, fish culture and mushroom culture. As it is required to improve home economy as soon as possible, the projects will be put into practice in the first year in the Short Term. Animals such as cattle/Carabao, swine, goat and poultry will be raised in the livestock & poultry development. It will employ a revolving method, called “Animal Dispersal Plan”. A NGO will lead the project in the first year in the Short Term Development Plan, and Barangay Council will manage it later. The backyard gardening technologies will be disseminated to women in the ARC. A demo-farm shall be established, an extension worker will give practical

training one (1) each at a Purok, at the same time. The knowledge and skills learned will be disseminated to other farmers. In addition, the extension workers will provide seed for demonstration purposes. The project will be carried out in the first three (3) years.

The fish culture activity will be led by NGO. The agricultural extension workers will judge the land topographically, and fishpond will be constructed with SFR project in the first year. Fish raising will start in the second year with the fry to be provided by CVROSFR for free within a period of three (3) years. The grower shall purchase the fry by himself after said period. Mushroom culture will be extended to women practically with the skills taught by the extension workers. The extension workers shall be trained first at RCPC. This project will be executed from the first year. The seed fungus will be provided by RCPC for free in the first year, and the growers shall buy it by themselves later.

1.6.3 Management Capability Building Plan

The details of the Plan are shown in 6.3.3 of the Part I. The objective of this Plan is to increase the management capability of the agencies' staff as well as the farmer beneficiaries through the training for the effective and efficient implementation of the proposed development plans. The training will principally be conducted at the municipality level. The target agencies' staffs are the DARPO's staff, government officials of line agencies and LGUs, NGO staff and so on. The target farmer beneficiaries are mainly Barangay officials. All the training programs will be implemented within two years after the commencement of the project implementation. The impact survey at the end of the second year will review and determine if the training programs need to be continued.

The training programs included in the Plan are (1) Development Planning, (2) Planning Workshop cum Training, (3) Monitoring and Evaluation, (4) Training to Trainers and (5) Project Management (Social Preparation).

1.7 Project Execution Plan

As shown in 6.8.3 " in Part 1 of this report, the first development priority will given to "Management Capability Building Plan", "Farmers' Organization Strengthening Plan" and "Rural Credit Plan" to improve farmer's and MPCI's management capabilities. Therefore, they should be started before all others plans. "Livelihood Development Plan" will be carried out for individual farmers. Although this will directly contribute to the improvement of living standard of the farmers, there have been several similar projects and there seems no need of specific new instruction and training.

These four (4) plans will start at the first year in the short-term development period. "Management Capability Building Plan" will be carried out for two (2) years in the short term development period. As the management capability building of the LGU and promotion of agricultural technology to agricultural extension workers will be achieved in the first year. The components managed by Barangay, such as multi purpose solar dryer (including multi-purpose pavement) in the framework of "Prost Harvest Facility Development Plan", "FTMR development" and "Agriculture Development Plan" will follow. "Agriculture development" is to be undertaken with the assistance of DA. The construction of the multi purpose dryer will be promoted with the assistance of LGU who will supply materials, labors and construction machines. Through the process of construction and supervision, the farmers of the Barangay will themselves improve their technology, management and maintenance skill. Considering this, the works will be carried out for the long period. After the improvement of capabilities of LGU, LGUs or the Barangay will carry out FTMR Development on the contract basis. The work will start in the second year like that of the multi purpose dryer.

The MPCI will be in charge of the management and maintenance of the warehouse as well as its construction. In consideration of this, the construction of the warehouse will start at a time when the MPCI is prepared to take up the work, and the CBU has come up to more than 200,000 peso (the seventh (7^{th}) year from the beginning of the short-term development program).

The introduction of hybrid rice needs stable supply of water through the irrigation system. As this ARC has already the irrigation system, this is scheduled to start at the beginning of " Agriculture Development Plan". The implementation schedule of each component for the Lapogan ARC is shown in Figure 1.7.1.

Figure 1-7-1 Tentative Implementation Schedule

(Quiling ARC)

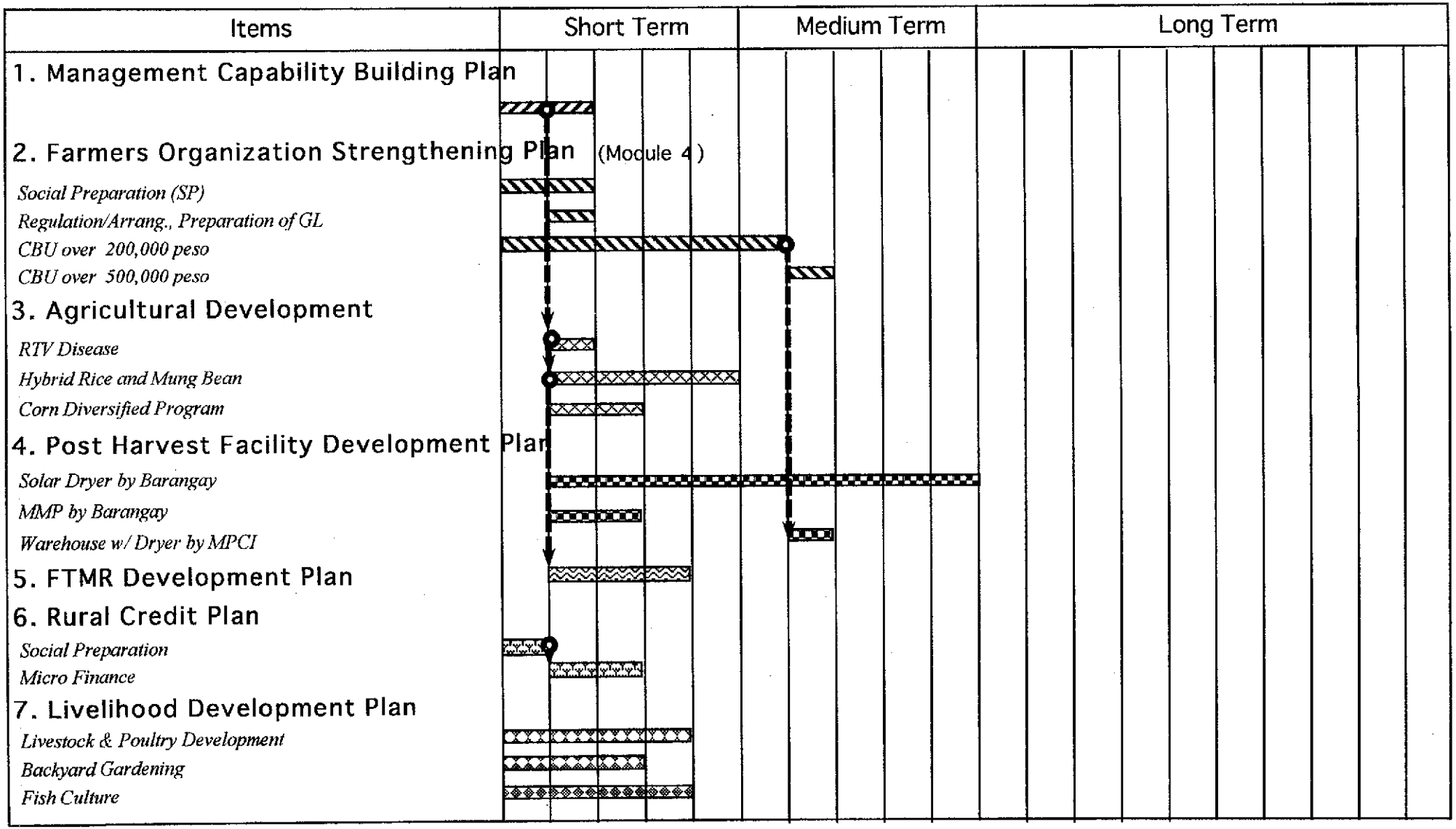
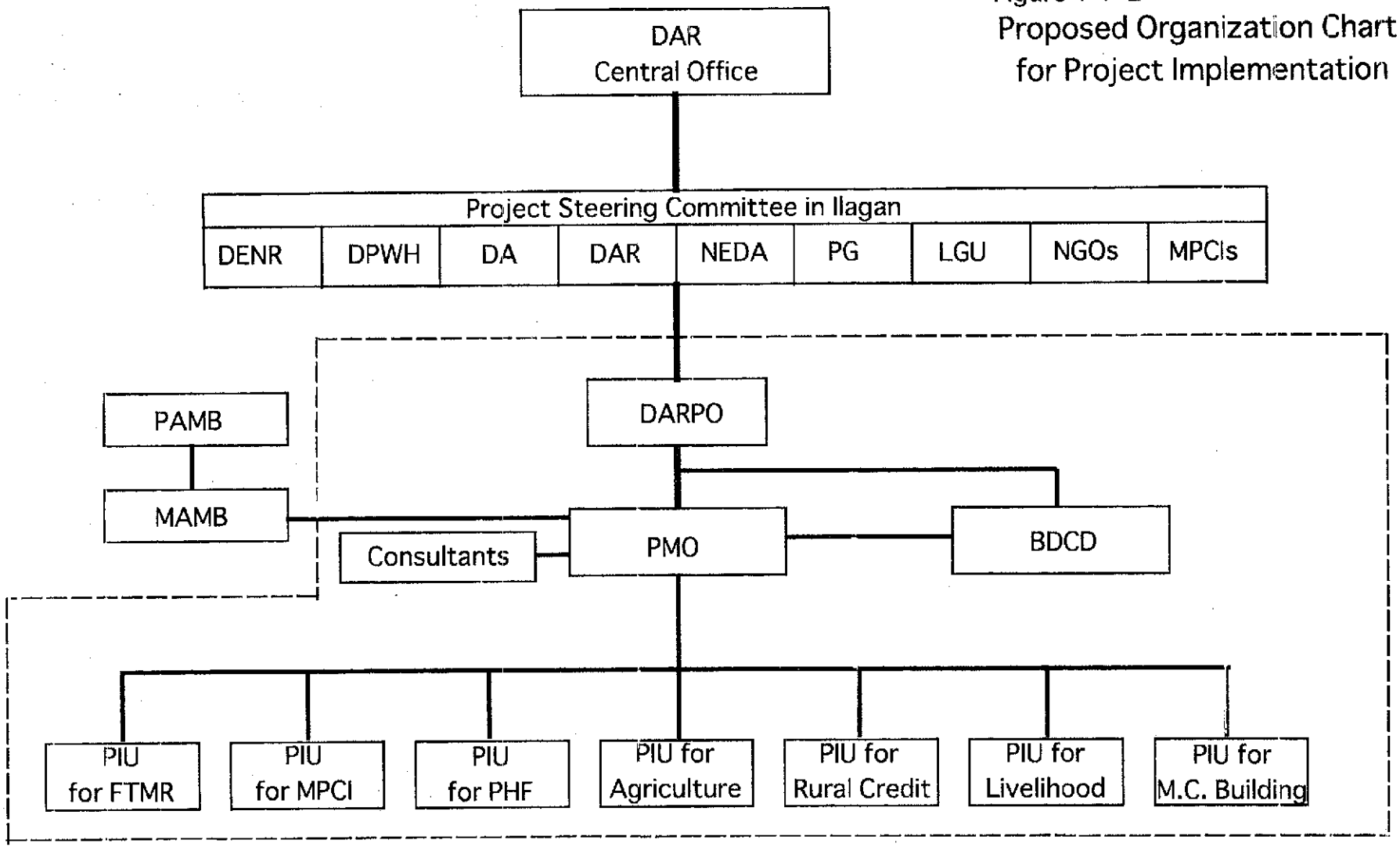


Figure 1-7-2
Proposed Organization Chart
for Project Implementation



Note: PMO - Project Management Office
PIU - Project Implementation Unit
PHF - Post Harvest Facilities
FTMR - Farm to Market Road
MAMB - Municipal Agrarian Reform Management Board
PAMB - Provincial Agrarian Reform Management Board
M.C.Building - Management Capability Building
MPCI - Multi-Purpose Cooperative Inc.
BDCD - Beneficiaries Development and Coordination Division
DARPO - Department of Agrarian Reform Provincial Office

1.8 Operation and Maintenance Plan

O&M works of the irrigation facilities are provided by MRIIS Office for the main canal and by the IA for the on farm facilities. The activities of the IA in Quiling ARC shall include the following.

1. Crop pattern and scheduling with assistance by extension workers
2. Repair works of the on farm facilities
3. Guidance for the rotational irrigation and check-up for illegal water distribution

When technical problems is taken place which the IA can not manage, the NIA-MRIIS shall provide assistance and guidance to the IA. The IA shall also undertake additional activities like weed control on the canals, and collection of water charge. In the case of a disaster, rehabilitation works will be executed under the assistance of NIA and PIO. IA has to bear a part of the necessary cost for rehabilitation.

The multi purpose dryer under the Barangay management shall be maintained through the rental charges that will be collected from the users. Barangay will decide the amount of the rental charge. They shall be kept in "Special Account of Solar Dryer" and used shall be utilized for the repair of the facility as necessary.

The management and maintenance of the warehouse shall be managed and maintained by the MPCI.

LGU will be in charge of the management and maintenance of the roads, and beneficiaries of the farm road shall be responsible for the expenses of fuel for a machine, supply of labor and snack under the existing rule of LGU.

1.9 Project Cost

The unit costs/prices are determined considering the recent projects executed by the line agencies and NGOs in June 2000. The exchange rate based on the average rate for three months from March to May 2000 are applied for this estimate.

1.0 US$ = 42.0 pesos = 106.0 Japanese yen
For cost estimate, the following assumptions are applied:

Administration Cost:	8 % of direct construction cost
Physical Contingency:	10 % of costs such as direct construction cost, administration cost

For estimation of price contingency, the annual price escalation rate of 2.0 % for the foreign currency portion is used based on the average rate for advanced five (5) countries. The annual price escalation rate of 9.4 % for the local currency portion used is based on the average rate for one (1) year from July 1998 to June 1999.

The total project cost amounted to 92 million pesos. The necessary project costs by short, medium and long term development period are 64 million, 18 million and 10 million pesos, respectively. (refer to Table 1-9-1)

The operation and maintenance costs consist of fuel costs and electricity of facilities, repair cost of the offices and labor cost, O&M and general management costs. For physical contingency, the assumption applied is 10 %. The necessary operation and maintenance costs by short, medium and long-term development period are 20 thousand, 410 thousand and 850 thousand pesos, respectively. (refer to Table 1-9-2)

Table 1-9-1 Project Cost

unit : '000 pesos

Development Plan	Quantities	Short Term			Medium Term			Long Term			Total		
		LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Agriculture Development Plan		24	0	24	0	0	0	0	0	0	24	3	24
1.1 RTV disease Training	1 L.S	4	0	4	0	0	0	0	0	0	4	0	4
1.2 Hybrid rice and Mungbean introduction	1 L.S	10	0	10	0	0	0	0	0	0	10	1	10
1.3 Crop diversification (vegetables)	1 L.S	10	0	10	0	0	0	0	0	0	10	2	10
2. Irrigation Development Plan	0 ha	0	0	0	0	0	0	0	0	0	0	0	0
3. Post-Harvest Development Plan		805	560	1,365	2,807	1,743	4,550	0	0	0	3,612	2,303	5,915
3.1 Solar Dryer by Barangay (1)	1,384 sq.m	599	414	1,013	0	0	0	0	0	0	599	414	1,013
3.2 Multi Purpose Pavement	800 sq.m	206	146	352	0	0	0	0	0	0	206	146	352
3.3 Solar Dryer by Barangay (2)	2,768 sq.m	0	0	0	1,199	827	2,026	0	0	0	1,199	827	2,026
3.4 Solar Dryer by Cooperative	2,647 sq.m	0	0	0	1,146	792	1,938	0	0	0	1,146	792	1,938
3.5 Mechanical Dryer	30 cavan	0	0	0	238	26	264	0	0	0	238	26	264
3.6 Warehouse	140 sq.m	0	0	0	224	98	322	0	0	0	224	98	322
4. Farm-to-Market Road Development Plan		496	474	970	0	0	0	0	0	0	496	474	970
4.1 Construction of FTMR	1.9 km	277	265	542	0	0	0	0	0	0	277	265	542
4.2 Rehabilitation of FTMR	1.5 km	219	209	428	0	0	0	0	0	0	219	209	428
5. Farmers' Organization Development Plan	1 L.S	629	167	796	122	3	125	0	0	0	751	170	921
6. Rural Credit Plan	1 L.S	0	0	0	885	707	1,592	1,884	1,012	2,896	2,769	1,719	4,488
7. Livelihood Development Plan		199	0	199	0	0	0	0	0	0	199	0	199
5.1 Livestock & poultry development	1 L.S	164	0	164	0	0	0	0	0	0	164	0	164
5.2 Backyard gardening	1 L.S	7	0	7	0	0	0	0	0	0	7	0	7
5.3 Fish culture	1 L.S	28	0	28	0	0	0	0	0	0	28	0	28
8. Management Capability Building Plan	1 L.S	162	396	558	10	40	50	0	0	0	172	436	608
9. Operation and Maintenance Equipment	1 L.S	1,080	8,515	9,595	0	0	0	0	0	0	1,080	8,515	9,595
10. Consultant Service Fee	1 L.S	10,071	23,947	34,018	887	2,922	3,809	0	0	0	10,958	26,869	37,827
Sub-Total		13,466	34,059	47,525	4,711	5,415	10,126	1,884	1,012	2,896	20,061	40,486	60,547
Administration Cost (8%)		1,077	2,726	3,803	377	434	811	151	81	232	1,605	3,241	4,846
Sub-Total		14,543	36,785	51,328	5,088	5,849	10,937	2,035	1,093	3,128	21,666	43,727	65,393
Physical Contingencies (10%)		1,454	3,679	5,133	510	583	1,093	205	109	314	2,169	4,371	6,540
Sub-Total		15,997	40,464	56,461	5,598	6,432	12,030	2,240	1,202	3,442	23,835	48,098	71,933
Price Escalation		5,094	2,395	7,489	5,332	899	6,231	5,816	336	6,152	16,242	3,630	19,872
TOTAL		21,091	42,859	63,950	10,930	7,331	18,261	8,056	1,538	9,594	40,077	51,728	91,805

Table 1-9-2 Operation and Maintenance Costs

unit : '000 pesos

Development Plan	Short Term			Medium Term			Long Term			Total		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Irrigation Development Plan	0	0	0	0	0	0	0	0	0	0	0	0
2. Farmers' Organization Development Plan	15	0	15	3	0	3	0	0	0	18	0	18
3. Rural Credit Plan	0	0	0	319	0	319	638	0	638	957	0	957
4.Others	7	0	7	47	0	47	140	0	140	194	0	194
Sub-Total	22	0	22	369	0	369	778	0	778	1,169	0	1,169
Physical Contingencies (10%)	2	0	2	37	0	37	74	0	74	113	0	113
TOTAL	24	0	24	406	0	406	852	0	852	1,282	0	1,282

1.10 Project Evaluation

1.10.1 Farm Budget Analysis

Farmers at Quiling earn most of their income from the production of paddy and corn in both wet and dry seasons. The farm budget analysis of these major crops at Quiling is shown in Tables J-56A to J-59A in Appendix J. Other minor crops produced include field crops (peanut and mung bean) and vegetables (string bean and eggplant). Livestock and fish production possibly raised at Quiling are Tilapia, hog fattening and backyard poultry production. The farm budget analysis of all these minor crops as well as livestock and fish farming are shown in Tables J-4A to J-29A in Appendix J.

The net production values (NPV) of most annual crops (rice, corn, beans, vegetable) are always positive. Those of fruits with high investment in the first year and zero earning in the following four (4) to six (6) years are negative before gradually becoming positive for the remaining long years afterwards. The NPVs of livestock and fish farming which require high investment in the first year, mostly end up with negative NPV in the first year and very high NPV later on.

1.10.2 Project Evaluation

(1) Financial Analysis

The financial analysis of the Quiling ARC is based on the following assumptions:

- Using the production (input-output) and price coefficient from the financial analysis of individual enterprises possibly produced in the ARC, which are shown in Table J-4A – J-29A and J-59A in Appendix J.
- The Base or Low case assumes a 5 % increase in annual production of every farm enterprise With-Project starting from 2nd year to 5th year before leveling off thereafter, or a maximum of 20 % production growth in 5th year.
- The High level assumes a 10 % increase in annual production of every farm enterprise With-Project starting from 2nd year to 5th year before leveling off thereafter, or a maximum of 40 % production growth in 5th year.
- The difference between the With-project and the Without-project cases, or the cash flow, after deducting the Project Cost to become Net Cashflow is used in the computation of the FIRR.
- Finally, the financial analysis of the Quiling ARC indicates an acceptable FIRR of 24 % for the Low case and 34 % High case. Their Net Present Worth at 15 % opportunity cost of capital are 16.67 and 36.69 million pesos, respectively.
- The sensitivity tests of the low-case FIRR indicate its strong resistance to reduced benefit (24 %), increased production cost (more than 50 %) and increased project

costs (41 %). Those of the High case are 41 % decrease in production benefit; and more than 50 % for both the increased production and project costs.

(2) Economic Analysis

Economically, there are two ways of deriving the Economic Internal Rate of Return (EIRR) of a project. One is to apply the Standard Conversion Factors (SCF) to the financial prices of all inputs and outputs used in the analysis. The other is through applying the Shadow Exchange Rate (SER). Algebraically, the relation between the SCF, SER, the Official Exchange Rate (OER) and the Foreign Exchange Premium (FX) are as follows:

SER = OER x (1 + FX premium) = OER/SCF

SCF = 1/(1 + FX premium) = OER/SER

While SCFs are generally used for an internationally financed project, the requirement of the NEDA/ICC is that the SERs be used in deriving the EIRR to any project submitted for its consideration. The suggested values of the two are currently given by NEDA are given below;

Variables	International Standard	NEDA/ICC
1. Foreign exchange rate	OER	Shadow exchange rate
2. Conversion factors	SCF	SER
3. Tradable items	SCF = 1.0	SER= 1.2
4. Non-tradable items	SCF = 0.8	SER= 1.0
5. Unskilled labor	SCF = 0.6	SER= 0.6

The two major food grains in the Quiling ARC, namely, rice and corn, are regarded as tradable items in the economic analysis of this report.

Apart from the EIRR calculated on the basis of the SER, another sets of EIRR calculated based on the SCF are as follows. In general, the EIRRs derived from the two factors are very close. Possible deviations from each other are due to the different proportion of the tradable and non-tradable inputs applied and output produced. (refer to Table J-75C in Appendix J)

Results of EIRR Calculation (%)

Case	Quiling ARC	
	w/ SER	w/ SCF
Low	23	22
High	38	37

1.10.3 Financial Viability of Implementing Agencies

The financial viability of the Roxas Municipality where the Quiling ARC belongs in terms of its Net Loanable Allowance (NLA) as shown in Table J-75A in Appendix J are much higher than the proposed project development costs in every year.

1.10.4 Initial Environmental Examination (IEE)

The proposed ARC development plan consists of the agriculture development, post-harvest development, farm-to-market road development, farmers' organization development, rural credit, and livelihood development plans and management capability building. The environmental checklist covers the development plans. (refer to Table 1-10-1)

These development plans will not have serious impact on the present environment condition, because the development plans proposed are small in scale. Consequently, Environmental Impact Assessment (EIA) is not necessary. The impacts of the proposed ARC development plans are presented as follows:

(On Socio-Economic Environment)

- Income gap is observed between developed and undeveloped ARCs. However, the proposed development plans when implemented will reduce the gap.
- Existing system/custom and social structures will gradually be changed by the farmer's organization development plan. However, since the development plan will only strengthen the existing multi purpose cooperatives, the impact may not be extensive.

If the existing farming practices will continue, it will have a negative impact on the existing environment. The following environmental conservation measures will be considered in the implementation of the proposed development plans:

- Extension of Integrated Pest Management (IPM) to decrease utilization of chemicals and pesticides.

Table 1-10-1 Environmental Checklist

Environmental Issues \ Activities of Construction	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
I. Socio-economic Environment													
1. Social Life													
(1) Living													
- Planned resettlement													
- Non-spontaneous resettlement		C	C	C	C	C	C	C	C				
- Change in life style	C	C	C	C	C	C	C	C	C	C	C	C	
- Friction among inhabitants	C	C	C	C	C	C	C	C	C	C	C	C	
- Indigenous people / Minority / Nomad													
(2) Population													
- Population increase													
- Sudden change in population composition													
(3) Economic activities													
- Shift of economic activity base	C	C	C	C	C	C	C	C	C	C	C	C	
- Shift in / economic activities unemployment	C	C	C	C	C	C	C	C	C	C	C	C	
- Expansion of economic gap	B	C	C	C	C	C	C	C	C	B	B	B	
(4) Institution / Custom													
- Resettlement of water right / fishery right		B	B									C	
- Change in social structure (e.g. organization)	C	C	C	C	C	C	C	C	C	B		C	
- Restructuring of existing system / custom	C	C	C	C	C	C	C	C	C	B		C	
2. Health / Sanitation													
- Increase in pesticide use	C											C	
- Outbreak of endemic disease	C	C	C	C	C	C	C	C	C			C	
- Spread of infectious illness	C	C	C	C	C	C	C	C	C			C	
- Accumulation of residual toxic (e.g. pesticides)													
- Increase in waste / excrement													
3. Historic spot / Cultural heritage / Scenery													
- Damage and destruction of historic spot / cultural heritage		C	C	C	C	C	C	C	C				
- Loss in important landscape or scenery	C	C	C	C	C	C	C	C	C			C	
- Impact to buried cultural assets		C	C	C	C	C	C	C	C				

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

////: not applicable

(Continue)

Table 1-10-1 (Continued)

Environmental Items \ Activities of Construction	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
II. Natural Environment													
4. Valuable life / ecological area													
- Change in vegetation	C	C	C	C	C	C	C	C	C			C	
- Impact to scarce or specific animal or plant species													
- Diversity of species	C	C	C	C	C	C	C	C	C			C	
- Penetration / Propagation of a harmful life	C	C	C				C	C	C			C	
- Extinction of wetland / peat bog													
- Extinction of tropical forest / wild land													
- Destruction of mangrove forest													
- Destruction of coral reef													
5. Soil / Land													
(1) Soil													
- Soil erosion	C											C	
- Salinization of soil	C											C	
- Fall in soil fertility	C											C	
- Soil contamination	C	C	C				C	C	C			C	
(2) Land													
- Land degradation (including desertification)	C	C	C				C	C	C			C	
- Hinterland degradation	C	C	C				C	C	C			C	
- Land subsidence	C	C	C	C	C	C	C	C	C			C	
6. Hydrology / Water quality													
(1) Hydrology													
- Change in surface runoff	C	C	C	C	C	C	C	C	C			C	
- Change in groundwater runoff / level	C	C	C	C	C	C	C	C	C			C	
- Inundation / Flood	C	C	C	C			C	C	C			C	
- Soil deposit	C	C	C				C	C	C			C	
- Fall in riverbed													
- Shipping													
(2) Water quality / Water temperature													
- Water pollution / degradation	C	C	C	C	C	C	C	C	C			C	
- Eutrophication	C	C	C	C	C	C	C	C	C			C	
- Change in salt-water													
- Change in water temperature	C	C	C	C	C	C	C	C	C			C	
(3) The air													
- Air pollution	C	C	C	C	C	C	C	C	C			C	

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

▨ : not applicable

Chapter2

Lapogan ARC

Chapter 2 Lapogan ARC

2.1 Category of the ARC

Based on the ARC classification and clustering, Lapogan ARC is categorized as follows:

Area	Geographic Condition	Possibility of Irrigation Development	Current Irrigation Facilities	LTI (%)	Strategic Vitality of Farmers Organizations: Current Condition and Motion
Developing Area	Almost flat	Yes	Not fully equipped	100	High vitality and moving upward

2.2 Present Conditions and Problems

2.2.1 Agriculture

(1) Present Conditions

Lapogan ARC is adjacent to Cagayan Province. It is almost flat on the river terrace except, a small hills towards the highway. Out of 894 ha of farmland, 95 ha are planted to rice; 75 ha of which, under the natural rain and merely 20 ha under pump irrigation. Corn is grown at 460 ha. The low hills are not largely used for farming at 339 ha. Soils are sandy loam on the river terrace. There are farmers who are engage in fishing in the Cagayan River while they are free from farming.

Rice is grown once a year under the rainfed condition. It is planted during September and harvested in January. The yield of the rainfed rice does not exceed 50 cavan/ha on the average. Irrigated rice is grown twice from May to September and from October to February, yielding about 80 cavan/ha in both seasons. The ARC produces about 6,950 cavans of palay (348 MT) in a year.

Corn is planted twice a year under the natural rainfall from April to August, and from October to February. Corn yields is 75 cavan/ha in both seasons, and the ARC produces 69,000 cavans (3,450 MT) of corn in total per annum. Vegetables and fruit trees are grown at the backyard garden such as mung bean, sweet potato, eggplant, squash, mango and jackfruit and they are usually sold at the local market. The animals are kept in a small scale at the homestead as well. The main farm products in this ARC are as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Total (cavan)	Total (MT)
Rice	95	20	80.5	80	5,350	1,600	6,950	348
Corn	460	460	75.0	75	34,500	34,500	69,000	3,450

(2) Problems

The farmers have been dreaming of the irrigation system for a long time because the Cagayan River with abundant water is flowing near or beside the ARC. The topography of the land in the ARC is almost flat, however, no irrigation system is established The farmers wanted to change their cornfield to paddy, once the irrigation system is constructed. The rice yields is very low under the rainfed condition, also gains from corn are very low. There were no roads constructed in the farmland or there are few roads constructed within the ARC, however, they are rough hence, hauling cost is high. The area on the small hills is not fully utilized for farming. Most of the farmers borrow money or depend their farm inputs from private traders.

2.2.2 Agriculture and Rural Infrastructures

(1) Present Conditions

a) Irrigation

Most of the farmland in Lapogan ARC was planned as part of the Tumauini Irrigation Project in 1979 and the construction of the canal with the length of about 800 m was completed then. However, due to lack of the budget for the water storage dam, the irrigation system in the Lapogan irrigation project area had not been constructed. The facilities (embankment canals) were destroyed and the right-of-ways of these canals were returned to the original owners. At present, about 20 ha out of the total farmland area of 894 ha in the Lapogan ARC is irrigated with small deep-well pumps under financial assistance from DA. Pump owners irrigate their farmlands and offer water to the neighboring paddy field at high charge.

b) Post Harvest Facilities

As post harvest facilities available there are solar dryers. There are three (3) multi purpose solar dryers owned by MPCI and offered to both the members and non-members of MPCI. The charge imposed to non-members is two (2) times higher than that paid by members. The present conditions of the post harvest facilities are shown as follows.

Present Conditions of Post Harvest Facilities (Lapogan ARC)

Facilities	No. of Places	Size	Area
Multi-purpose drying facility	12	15m x 28m	5,040 sq.m
Multi-purpose pavement drying facility	1	800m x 5m	4,000 sq.m

There is neither a warehouse nor a mechanical dryer in the Lapogan ARC.

c) Farm to Market Road

From Poblacion to the center of Barangay Lapogan runs the Maharlika highway (national road). A Barangay road branched from the national road. Other roads in ARC are as follows:

Roads	Length (km)	Width (m)	Remarkes
Entry road from the national highway	7.0	3 to 5	gravel road
Road in the residential area	2.0	3 to 5	almost gravel road
Farm road	7.0	1 to 3	unpaved, partially repaired through CARP fund

The entry road from the national road is a gravel road and almost always-passable even in the rainy season. Some portions in the residential area have lower level than the farmland thus, becomes not passable in the rainy season. Farm roads are not passable in the rainy season as their ground level has not been raised and easily get muddy.

(2) Problems

There is no general irrigation system in ARC. Irrigation with private small pumps is limited to only a part of the area. Most of palay is grown under rainfed condition.

The shortage of the post harvest facilities has compelled the farmers to sell the crop without well drying, leading to reduction of income by about 2.0 peso/kg.

There is said almost no road except the one that runs through the village. The farm roads are impassable during the rainy season. The difficulty in carrying the thresher deteriorates the quality of the crop and reduces the selling price. Even when the threshers are carried into the farmland, the transportation of the machine has to depend on many labors through the long, muddy and soft paddy field. The shortage of farm roads has influenced the production cost of the crop.

2.2.3 Farmers' Organization

(1) Present Situation

Although it did not engage in any activities of particular note immediately following its establishment in 1989, the Lapogan MPCI received funding of 489,000 pesos from LBP in 1990 and provided it to 29 of its members[1]. Problems were encountered with repayment right from the first installment (1990), mainly due to a natural disaster. As of 1998, none of the funding had was repaid, and the outstanding amount (including interest) had ballooned to 550,000 pesos. The major reasons for the lack of repayment in the wake of the disaster are as follows.

a) The debt collector sought repayment on the occasion of the first installment, but did not do so strongly because he was a victim of the disaster himself (and had received some of the funding). In addition, the collector had no extra incentive for collection and adopted a passive attitude toward the job beginning with the next installment.

b) The failure to repay on one installment drives up the interest portion for the next. In the extreme case, failure to repay loans from lenders can lead to confiscation of land and property. By comparison, LBP loans were based on a collective responsibility that did not involve the confiscation of the individual's property, and borrowers therefore did not feel obliged to repay unless others did.

In 1998, the BOD was reorganized[2]. Upon this reshuffling in its officials[3] layer, the cooperative regained its vitality, and it is attempting to heighten its level of vitality today as well. At present, 95 of its members regularly pay CBUs. The membership roll contains a total of 175 names. With its revitalization, the cooperative has resumed repayment of its debt. The repayment is proceeding smoothly, and the balance, which had reached 550,000 pesos at its peak, had been reduced to 300,000 pesos as of the fourth quarter of 1999, for a repayment percentage of 45 %. Over the last few years, the new officials have been promoting a program of internal reform centered around the following six (6) items, and achieving results in the process.

a) Increase in the frequency of regular meetings (so that all members are brought together about once a month)

b) Institution of a new repayment system (Composary system; since 1998, the cooperative has held in common the land of members in arrears under a standard of 0.5 ha for every 5,000 pesos of repayment due, and is applying the harvest to the loan repayment)

c) Commencement of collection of CBUs through payment in kind (collection of 50 kg of corn per year in place of the CBU, and conversion into cash by the cooperative); the CBU reserve currently comes to about 70,000 pesos, and has increased greatly since the new executives took office; the

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[1] Membership in the cooperative jumped as soon as its receipt of financing had been determined.

[2] The current head of the cooperative served as its manager until 1994. He was motivated to run for the BOD by visits to other cooperatives that were performing well.

[3] The following is a characterization of the president of the cooperative as far as could be determined by the consultant.

* The president of the cooperative finished two years of junior college and is aged 48. He is among the best educated of the farmers. He owns 6 hectares of land, all of which is cultivated with corn. His fields are not equipped with irrigation facilities. He has two small children, and insists that he feels no anxiety about the future.
* He has a strong sense of mission that he must do something.
* He calls himself "perfectly clean" and has long-range perspectives on the cooperative's operation.

cooperative is gradually building up the reserve while repaying its debt.

d) Information disclosure (disclosure of all information on cooperative activities to the members; start of preparation of a report for this purpose)

e) Formulation of a plan for the future (a two-year action plan; in addition, drafting of a plan for complete repayment of the loan in two years based on the Composary system)

f) Consultation with the Barangay committee (coordination with the Barangay committee headed by the Barangay captain in accomplishment and management of project works)

As his own ideal, the head of the cooperative cited the Santa Maria MPCI in Isabela Province and the Clavera Grassroots MPCI in the province of Cagayan. He intends to increase the level of cooperative vitality taking the development processes at these cooperatives as a model. He is actively attempting to emulate the latter, to which he is sending tours of inspection. The procedure for revival of the cooperative is being examined in terms of three steps: 1) renewal of the board, 2) institution of new measures for revitalization, and 3) increase in executive powers of cohesion.

(2) Problems

a) Lack of knowledge of rules by all members

Only the officials are in possession of the bylaw and policies of the MPCI. It is the policy of the cooperative to show these documents to members desiring to see them. Furthermore, these documents are prepared in English, and it could not be said that all members understand them. It may also be observed that the cooperative is currently being driven by the absolute leadership of the president and the Barangay captain, and that the organization runs the risk of, in effect, belonging to them.

b) Lack of a system for human resource development

There are no provisions for developing successors needed to maintain the current level of vitality. Capabilities for dealing with exceptional cases are low when the head of the village or cooperative is absent. This is thought to be due to the lack of appropriate training and the suppression of the rise of younger members by the cooperative brass.

c) Lack of an atmosphere conducive to a free airing of opinion

With the command-type disposition of the organization, arrangements for free discussion and collection of opinions from the rank-and-file are not functioning. This is breeding a herd mentality and making it difficult to incorporate new technology and systems on the initiative of the farmers themselves. The tendency for internal discussion to be dominated by a handful of members raises the possibility of the adoption of policies that ignore the interests of the weaker members.

2.2.4 Rural Economy

(1) Present Situation

The Lapogan ARC is composed only of the Barangay Lapogan, which has a total population of 2,251 in 398 households (of which 12 percent are ARB households). Land ownership averages 2.2

hectares per household. Virtually all of the production is sold to traders. The prices per kilogram are as follows.

Products	Wet season	Dry season
Palay	8.5 pesos per kg (to private trader)	-
Corn	5.0 pesos per kg (to private trader)	7.0 pesos per kg (to private trader)

Production cost of rain fed rice and corn accounts for 14,600 and 17,235 pesos, respectively, per hectare per crop. Fertilizer occupies the largest share of the production cost accounting for 37 % of the total in the case of corn. Due to the underdeveloped state of production roads, the transportation cost comes to about 5 pesos/cavan of harvest, and accounts for about 3 % of the entire production cost.

The typical farm employed in the farm budget analysis owned 2.2 ha of land, consisting of 1.2 ha of rain fed rice and 1.0 ha of corn lands. The analysis estimated farming income at 70,650 pesos, off-farm income at 4,500 pesos, and non-farm income at 850 pesos, for a total annual income of 76,000 pesos. Based on information obtained from interviews, it is thought that the typical farm borrows about 8,000 pesos (equivalent to about 40 % of the production cost per crop) per season from private lenders, and applies almost all of it to purchase of farm inputs. Interview responses indicated that the typical farm is worried about repayment in the event of borrowing amounts that are more than 40 % as high as the farm income of 70,650 pesos.

(2) Problems

The average farm budget derives about 93 % of its total income from farming; and off-farm income and non-farm incomes taken together come to less than 6,000 pesos. Moreover, the income is concentrated in the season of land preparation and harvesting. As a result, the family has little ability to handle unforeseen expenses, and inevitably ends up depending on private lenders in such cases.

2.2.5 Problems of Supporting Systems and Operations

The BARC was established in 1992 and was active on land disputes only for the first year. The BARC has become inactive since then. The common contact point of the DF therefore has to be the Barangay officials. The BARC chairman is also the chairman of the MPCI. The officers of the BARC and the MPCI are the same.

The BDP is prepared regularly by the Barangay officials with the help of the municipal officers, or sometime the DF if the municipal officers did not present. The ARCDP was prepared in 1992 initially by the officials of the MPCI, the BARC and the DF. The Barangay officials did not participate in the planning because of the personal problem between the Barangay captain and the MPCI chairman on the management of the MPCI. The Barangay officials took no follow-up activities

after the planning of the ARCDP.

Besides the DF, the agency representatives visited the Barangay were only a few; a) the DA-LGU officer(s) who visited twice in 2000 to conduct farming skills training and distribute seeds, and b) the DPWH officer(s) who visited when infrastructure projects were implemented.

At the municipal level, there is no MCIT. The issues related to the CARP are discussed in the Municipal Development Council (MDC). Since all the problems of the municipality should be discussed in the MDC, only a little time is devoted to the CARP issues. This should be one of the reasons why the coordination and facilitation of the supporting services are inactive at the municipality level.

2.2.6 Results of the Workshop

The problem tree prepared through the workshop with the Barangay people is shown in Figure 2-2-1. The direct causes of low income identified are; a) No other sources of income than agriculture, b) low yield of the farm products, c) low price of the products, and d) high cost of production.

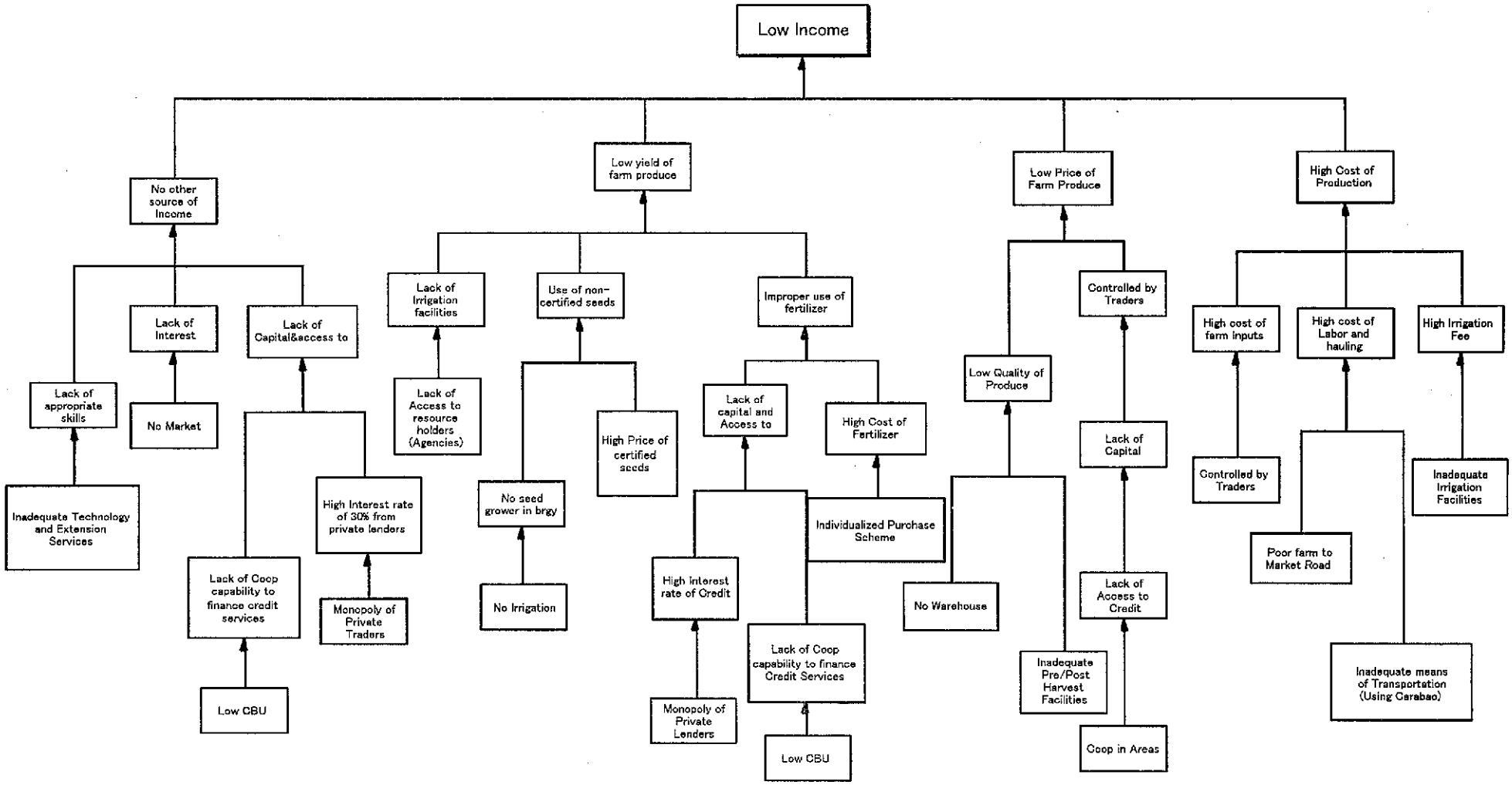


Figure 2-2-1 Problem Tree in Lapogan ARC

2.3 Diagnosis of Organizational Culture

(1) Positioning in Context of Cooperatives in the Study Area

a) Static analysis

In terms of a Diagnosis of Corporate Culture (DCC), the Lapogan cooperative falls in the "Kintaro" domain, with a high degree of "Strategic Vitality" and low degree of "Organizational Vitality". This indicates a situation of strict observance of the commands of a specific leader whose power permeates the organization. The BODs and the officials lead the cooperative. Their degree of "Strategic Vitality" is fairly high compared to that of the members. The coop president head ranks high in terms of both "Strategic-" and "Organizational Vitality", and is behind the progressive spirit in the cooperative. The "Long-term Orientation" is low among all of the members but high among the BODs and officials, who are operating the cooperative in accordance with a long-term vision.

Although the president of the cooperative rated the BODs as possessing good leadership capabilities, the BODs did not have such a high opinion of the influence and development capabilities of the president. The factors thought to be responsible for this phenomenon include the presence on the BOD of a person who formerly headed the cooperative and lost in the election to the current president, the relatively young age of the president, and his difference of opinion with the older officials on certain issues.

b) Dynamic analysis

In dynamic terms as well, the cooperative has an upward inclination ("Upturn" in movement survey), as indicated by the following phenomena.

i) The number of members attending public hearings and workshops, and their active voicing of views at them

ii) The communication on equal footing and active exchange of views between the Barangay captain and coop president

iii) The preparation of a long-term plan which the executives are capable of logically presenting

c) Historical development

The Barangay is made up of a majority of Ilocano and a few Kalinga ethnically, and it is virtually homogeneous. The institution of the Lapogan cooperative was supported by

the DA, which also recommended the appointment of the first president in 1989, the year of establishment. The DA selected him solely because he had a higher education than the others. In spite of the low ratings of the president by the members, the lack of member meetings, and the lack of cooperative capabilities, the president received a 50,000-peso loan from the LBP and relented it to 29 members without collateral, while also causing other problems. In addition, he tried to introduce monetary incentives into the BOD in spite of the lack of a CBU accumulation (this proposal was rejected by the BOD). As a result, the membership promoted a self-clean-up campaign that culminated in the election of the current president[1]. The president is given high marks for his administrative skills, and it is said to be a virtual certainty that he will win the next election.

(2) Evolution from "Kintaro" to "Vibrant"

The improvement of internal rules (bylaw, policies and so on), for which there are strong desires on the part of the membership, should be urgently addressed. The current rules, which were revised upon the inauguration of the new president, have the following problems.

i) All members may view the document, but the original must remain in the possession of the coop officials.

ii) Because it is written in English, members who have not been schooled in English cannot read the document.

iii) The document states what should be done but does not contain any provisions for penalties or incentives, and also does not have hedges against risks.

Judging from the forceful initiative of the president and the setup for cooperation with coop officials, there does not appear to be a strong need for the cooperative to seek NGO aid at the current stage. However, just fewer than 40 % of the roughly 250 eligible persons are already members, and it could be effective to use NGO energies for expanded membership and initial training

Up until the reorganization of the BOD in 1998, the Lapogan MPCI could be viewed as having belonged to the "Patay" domain. The major needs for an increase in the level of cooperative vitality are: 1) training for officials in the aspects of accounting, auditing, and bookkeeping in order to reinforce business, and 2) PMS and credit management (for members) in order to expand the membership and instill awareness of the need to repay loans. Training programs to these ends (which are also desired by the MPCI) may be expected to have the following effects.

[1] The former president is now a BOD and manager of the cooperative.

i) Acquisition of financial know-how needed for business operation and administration

ii) Expansion of the foundation of member cooperation; further increase in the cohesiveness of the current setup

iii) Instatement of behavior guidelines to encourage debt repayment on the person's own initiative

The implementation of a small-scale project is proposed as a means of further strengthening the unity of the cooperative as a whole. The project should be implemented in 2002, when the cooperative loan is completely repaid. The proposed subject is the raising of livestock (pigs), in accordance with the cooperative wants and needs. The project could start out with about ten pigs, and proceed to the next stage once it is confirmed that the benefit has reached all members.

2.4 Agriculture Development Scheme

2.4.1 Agriculture Development Plan

When an irrigation system is constructed according to the plan, farming in this ARC will be changed drastically. The system will irrigate 325 ha and production of corn will be converted to rice at 230 ha. After completion of the irrigation system, the cropping will be centered to rice as same as the ARCs in the "Prime area", and hybrid rice and mung bean will be introduced in the fifth (5^{th}) year. Hybrid rice will be grown at 82 ha and mung bean at 100 ha in the long term development stage. Production of rice is targeted to 120 cavan/ha on the average. The use of hybrid rice will be encouraged and extended through a season long training by PhilRice and extension workers. Mung bean will also be introduced at the same time.

Corn will be reduced from 460 ha at present to 184 ha. IPM and INM training that were already given to farmers shall be followed and to be put into practice by the farmers through the assistance of the extension workers. The target corn yield is set at 100 cavan/ha applying said technology Crop diversification will be promoted at 46 ha of the cornfield specifically at the slope where the land is not converted to paddy. High value fruit trees such as banana, etc. will be planted in place of corn. The diversification shall be promoted on a demo-farm through an extension workers and CVIARC. Farm production in the long term development stage is planned as follows:

Crops	Wet sea.	Dry sea.	Wet sea.	Dry sea.	Wet sea.	Dry sea.	Yield	Total	Total
	(ha)	(ha)	(cavan/ha)	(cavan/ha)	(cavan)	(cavan)	(MT/ha)	(cavan)	(MT)
Rice	325	325	120	120	39,000	39,000	-	78,000	3,900
Mung bean	0	100	0	0.8MT	0	80MT	-	-	80
Corn	184	184	80	80	14,720	14,720	-	29,440	1,472

Banana	20	-	-	-	-	-	f120	-	f2,400
Calamansi	6	-	-	-	-	-	6.6	-	39.6
Avocado	5	-	-	-	-	-	10.2	-	51
Santol	5	-	-	-	-	-	8.5	-	42.5
Guyabano	5	-	-	-	-	-	5.6	-	28
Mango	5	-	-	-	-	-	7.5	-	37.5

Note: f stands for finger ('000)

2.4.2 Irrigation Development Plan

(1) Objectives

The irrigation facility can enable farmers to get rid of unstable crop dependent on rainfall and can provide not only the stable income but also the possibility of selecting crop that could provide higher profit. Paddy field has the function of storing rainwater and contributes to the prevention of the flood in the downstream area. Technology of growing palay has already been established and the authorities can easily understand the need for governmental assistance for the promotion of paddy cultivation with minimal investment.

Based on the results of the Open Hearing with farmers in the Lapogan ARC, the farmers have the strong willingness to bear the cost of the construction and maintenance of irrigation facilities.

(2) Irrigation Plan

The amount of evapotranspiration was calculated by the Penman method based on the meteorological data for 30 years at Tuguegarao observatory. The minimum value is 4.0 m/day in January and maximum 7.9 mm/day in April and May. The values between maximum 1.20 and minimum 0.94 of crop coefficient obtained from the NIA criteria are adopted.

Water requirement for land preparation was calculated at 233 mm for the dry season and 317mm for the rainy season assuming the given thickness of effective soil layer and porosity. The water is to be supplied three (3) times in a month to the depth of 50 mm before planting. Due to the heavy soil, the percolation rate is assumed at 1.0 mm/day, the maximum net water requirement is 8.0 mm/day for cropping for the dry season cropping and 8.8 mm/day for the rainy season cropping. The overall irrigation efficiency is 0.5 based on the NIA criteria (transportation efficiency = 80 %, application efficiency = 90 % water distribution efficiency = 70 %). Therefore, unit water requirement per ha amounts to 2.06 lit/sec/ha.

(3) Facility Plan

The irrigation facility consists of the canals and its appurtenant facilities. The canal shall be composed of the main and lateral canals, and farm ditches. The canal will be designed as concrete paved canals, which concrete work or block pavement shall be applied. The cross section of canals shall be concrete and block rectangular canal. The appurtenant structures shall be an intake, drops, road crossings, etc. depending on the needs at the site. Along the main canal, roads for maintenance and farming shall be constructed.

a) Pump Station Plan

The pumping station shall intake water from the Cagayan River. The proposed irrigation system will cover the area of 325 ha with the gross water requirement of 325 x 2,06 lit/sec/ha = 669.5 lit/sec (=40.2 cum./min). The actual lifting head of the pump shall be 15 m based on the low water level of the Cagayan River and the discharge water level. The total head shall be 18 m in consideration of the friction loss in the pipes. The pump shall be applicable to both constant and peak time operations. Further, in preparation for the repair work, the load of the pumping shall be divided into two (2) pumps with a same type. A stand-by pump shall be proposed in case of the unexpected accident. The pump type shall be vertical, mixed flow with a diameter of 400 mm each driven by a motor of 110 kW, 3 units.

b) Canalization

The irrigation canals will be paved by concrete in principle to prevent the leakage of water. Among appurtenant structures are division works, drops, road crossing works, canal crossing works and regulating works, etc. The total length of the canals shall be 8.47 km, the main canal 4.08 km and the lateral canal 4.39 km.

(4) Water Management System

Irrigation water will be managed within a rotation block (25 to 50 ha depending on topographical condition) on the basis of the agreement among the farmers in the block. The rotational irrigation interval will be seven (7) days at the longest. The far ditches are classified into the main and farm ditches. The average acreage of the latter is 1/7 of the block area.

2.4.3 Post Harvest Facility Development Plan

(1) Objective

The post harvest facilities are introduced aiming to improve the quality of palay and corn and to increase the farmers' income through timely sale of the farm outputs at an advantageous price. Among the facilities multi purposes solar dryers, a warehouse and a mechanical dryer are proposed.

(2) Facility Plan

The facility will have the capacity to dry the total amount of palay, corn and other produce. The amount of the produce to be stored shall be 20 % (9,560 cavans) of the total planned produce. The necessary floor area of the warehouse will be 305 sq.m. Grains to be stored in the warehouse will be dried by water content of less than 14 % at the attached drying facilities for long storage. A mechanical dryer with the capacity of which is to be 80 cavan/day, will dry 75 % of the stored amount (15 % of the total production amount) in the solar dryer attached to the warehouse.

The plan for the construction of the drying facilities is shown as follows. (refer to Appendix F)

O&M Body	Drying Method	Ratio (%)	Planned Drying Amount (cavan)		Area (sq.m)
			rice	maize	
Private	garden	15	5,850	1,320	6,341
Barangay	multi-purpose drying	65	25,350	5,720	27,477
Cooperative	open drying yard	15	5,850	1,320	6,341
	grain drying machine	5	1,950	440	-
Total		100	39,000	8,800	50,159

The Barangay has seven (7) Plocks; each of them plans to install necessary number of multi-purpose drying facility.

(3) Implementation Schedule

In consideration of the vitality of the MPCI, the introduction of the post harvest facilities will be carried out in the following schedule.

a) Solar dryer in the private gardens

No specific schedule has been made since this belongs to private individuals/farmers. However, the construction will be expected introduction of the facilities during the short or middle term development program.

b) Dryers under Barangay management

In consideration of improving the management capability of the Barangay officials based on the management capability building plan, the ratio of irrigation area and the progress of agriculture development, the introduction will start in the second year of the short-

term development period and be completed during the short/middle term development periods. The dryers and the multi purpose dryers included in the Barangay Development Program are to be constructed at the early stage of the short-term development program.

c) Warehouses (including the solar dryer and mechanical dryer) under MPCI management

To be introduced after the cooperative has accumulated a CBU over 200,000 pesos. Therefore, this will be carried out during the short-term development program.

2.4.4 Farm to Market Road (FTMR) Development Plan

(1) Objective

The FTMR will be introduced to effect a timely transport of necessary machines into the farmland, keep the quality of the crop, reduce the hauling cost and increase the income of farmers.

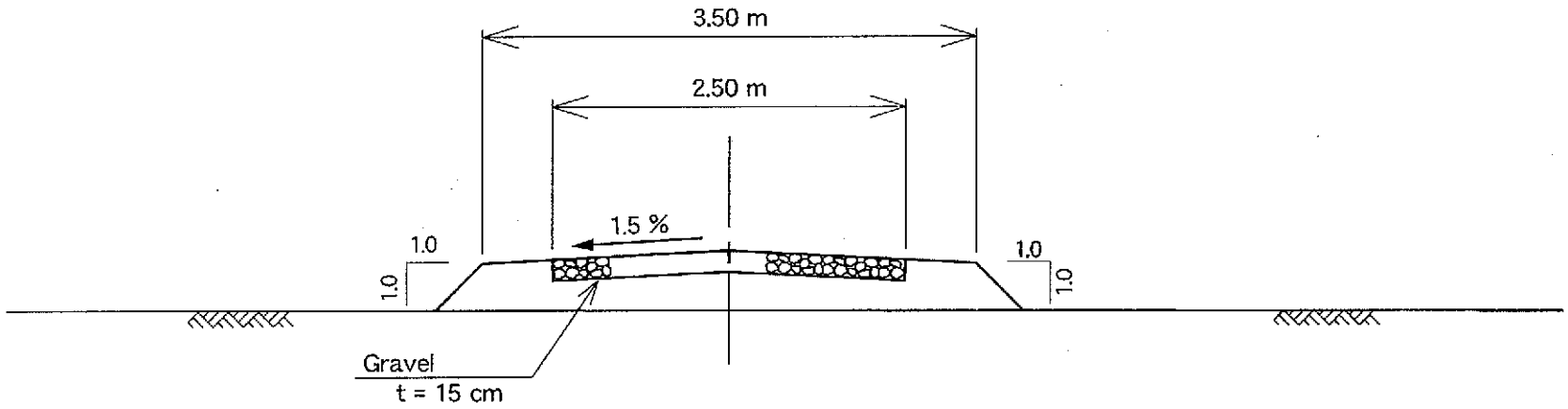
(2) Road Plan

Applying the criteria of 10 m/ha (based on 6.1.4, Part 1 of this report), the following roads are proposed at the locations that the right-of-ways were secured by DAR at the time of land distribution. The length of each road is shown as follows. (refer to the attached drawing)

Road	L 1	927.97 m
Road	L 2	616.50 m
Road	L 3	438.82 m
Road	L 4	405.18 m
Road	L 5	829.46 m
Road	L6	1,493.36 m
Road	L7	1,175.59 m
Road	L8	1,315.37 m
Road	L9	600.24 m
Road	L 10	1,050.80 m
Total		8,853. 35m

These roads lead from the main farm road crossing the village to the farmland. Each road section has the central part of 2.5m gravel width and the shoulder of 0.5 m on both sides. (refer to Figure 2-4-1 and section 6.1.4, Part 1 Master Plan)

Figure 2-4-1 STANDARD DRAWING OF FARM-TO-MARKET ROAD



Production Road

(3) Implementation Schedule

The Barangay have to manage the farm roads. The management capability building plan of the Barangay peoples will start in the first year of the dry season development program. Consequently, the management capability of the Barangay officials for maintenance is expected to improve in the second year. The construction of the farm road, therefore, will start in the second year at the rate of 1.0 km per year.

2.5 Farmers' Organization Development Scheme

(1) Objective

The objective of development is to increase organizational vitality of Lapogan MPCI from "Kintaro" to "Vibrant".

(2) Contents

a) Incorporation of penalty and incentive system to the existing MPCI policy will be prioritized together with the definition of policy on loan repayment. Further the translation to Ilocano language and distribution these rules to every member are accelerated in order that the coop members can understand them.

b) Introducing a new project will be realized when the accumulative CBU exceeds 200,000 pesos and 70 % of debt are repaid. Palay trading project is suitable. A 7-ton truck will be rented to the MPCI in order to bring produce to Manila. The MPCI will procure working capital for the project by submitting members' collateral.

c) Likewise, the MPCI will gradually expand the business. The timing of introduction of new project follows the module, which is illustrated in "6.8.2 Farmers' Organization Strengthening Schedule" in Main Report.

(3) Schedule

Component	Description	Outputs/Returns	Agency	Conditions to be implemented
<Short Term Development Plan>				
Revision of co-operative by-Law	Including policy on loan repayment	Formulation of coop regulations	DAR,NGO	Under Implementation
Increase member and expand coop size	Promotion campaign	Increase CBU toP200,000		
<Medium Term Development Plan>				
Increase member and expand coop size	Promotion campaign	Increase CBU toP500,000		
<Long Term Development Plan>				
Increase member and expand coop size	Promotion campaign	Increase CBU toP1,000,000		

(4) Support System

To strengthen management capability, the following training should be applied.

a) Leadership training for officers by DAR (2 persons x 2 weeks x 2 years)

b) Skill up training on accounting, auditing, and bookkeeping by CAVALCO (3 persons x 1 week)

Credit management training for members by DAR (80 members x 1 day)

2.6 Development Support Scheme

2.6.1 Rural Credit Plan

The MPCI should pay a total of 543,000 pesos of debt during Short Term Development period. New loans should not be provided to them until 70 % of existing debt is paid. Simultaneously, the MPCI should put a target to accumulate 500,000 pesos of CBU within first five (5) years, and one million pesos within the period of Long Term Development.

Microfinance (MF) will be applied to the segment whose income decreases by the development. Especially, it is recommended to implement this scheme by Diocese of Isabela Province toward Cursillo which consists of those carrying farm produce to Barangay at present, because they seem to reduce income by the construction of a farm-to-market road. Further, MF should be provided to female organizations (Lapogan RIC) in order to establish a business on simple food processing. Primarily the NGOs should carry out this MF. It is

recommended that the first step which requires a little amount of fund will be started by BIDANI, and then transfer the donor to CAVALCO after each member loan exceeds to 15,000 pesos that resulted from the good achievement in loan payment by the organization.

When the accumulative CBU exceeds 500,000 pesos that will probably occur in Medium Term Development period, the MPCI should register to GPC as a cooperative member. By doing so, the cooperative can expect diversified loan sources, and consequently, it can form a financially strong body toward emergency needs.

2.6.2 Livelihood Development Plan

The livelihood development plan in the ARC includes livestock & poultry development, backyard gardening, fish culture and mushroom culture. Considering it is required to improve the home economy as soon as possible, the above mentioned projects will be put into practice in the first year in the Short Term. Animals such as cattle/Carabao, swine, goat and poultry will be raised under the livestock & poultry development plan. It will employ a revolving method, called "Animal Dispersal Plan". An NGO will lead the project in the first (1st) year in the Short Term Development stage, and Barangay Council will manage it later. The backyard gardening will be disseminated to women in the ARC. A demo-farm shall be established one each at a Purok, given practical training by extension workers, and the skills will be dispersed to other farmers. The extension workers will provide seed for demonstration. The project will be carried out in the first three years.

Fish culture will be led by NGO. Agricultural extension workers will judge the land topographically, and fishpond will be constructed with a Small Fish Reservoir (SFR) project in the first year. Fish raising will start in the second year with the fry provided by CVROSFR free for three (3) years. The grower shall purchase the fry by himself after said period. Mushroom culture will be extended to women practically with the skills taught by extension workers. The extension workers shall be trained first at RCPC. This project will be executed from the first year. The seed fungus will be provided by RCPC for free in the first year, and the growers shall buy it by themselves later.

2.6.3 Management Capability Building Plan

The details of the Plan are shown in 6.3.3 of the Part I. The objective of this Plan is to increase the management capability of the agencies' staff as well as the farmer beneficiaries through the training for the effective and efficient implementation of the proposed development plans. The training will principally be conducted at the municipality level. The target agencies' staffs are the DARPO's staff, government officials of line agencies and

LGUs, NGO staff and so on. The target farmer beneficiaries are mainly Barangay officials. All the training programs will be implemented within two years after the commencement of the project implementation. The impact survey at the end of the second year will review and determine if the training programs need to be continued.

The training programs included in the Plan are: (1) Development Planning, (2) Planning Workshop cum Training, (3) Monitoring and Evaluation, (4) Training to Trainers and (5) Project Management (Social Preparation).

2.7 Project Execution Plan

As shown in 6.8.3 " in Part 1 of this report, the first development priority will given to "Management Capability Building Plan", "Farmers' Organization Strengthening Plan" and "Rural Credit Plan" to improve farmer's and MPCI's management capabilities. Therefore, they should be started before all others plans. "Livelihood Development Plan" will be carried out for individual farmers. Although this will directly contribute to the improvement of living standard of the farmers, there have been several similar projects and there seems no need of specific new instruction and training.

These four (4) plans will start at the first year in the short-term development period. "Management Capability Building Plan" will be carried out for two (2) years in the short term development period. As the management capability building of the LGU and promotion of agricultural technology to agricultural extension workers will be achieved in the first year. The components managed by Barangay, such as multi purpose solar dryer (including multi-purpose pavement) in the framework of "Prost Harvest Facility Development Plan", "FTMR development" and "Agriculture Development Plan" will follow. "Agriculture development" is to be undertaken with the assistance of DA. The construction of the multi purpose dryer will be promoted with the assistance of LGU who will supply materials, labors and construction machines. Through the process of construction and supervision, the farmers of the Barangay will themselves improve their technology, management and maintenance skill. Considering this, the works will be carried out for the long period. After the improvement of capabilities of LGU, LGUs or the Barangay will carry out FTMR Development on the contract basis. The work will start in the second year like that of the multi purpose dryer.

The MPCI will be in charge of the management and maintenance of the warehouse as well as its construction. In consideration of this, the construction of the warehouse will start at a time when the MPCI is prepared to take up the work, and the CBU has come up to more than 200,000 peso (the seventh (7^{th}) year from the beginning of the short-term development program).

NIA will supervise the design and construction of the proposed irrigation facilities. IA will participate at every stage, in the planning, designing and construction of the proposed facilities. The capability and activities of the IA is expected to improve in accordance with the support and technical assistance of NIA. Therefore, the works will begin after the social preparation, and rules and regulation in MPCI have been established.

The introduction of hybrid rice needs stable supply of water through the irrigation system. As this ARC has already the irrigation system, this is scheduled to start at the beginning of " Agriculture Development Plan". The implementation schedule of each component for the Lapogan ARC is shown in Figure 2.7.1.

Figure 2-7-1 Tentative Implementation Schedule
(Lapogan ARC)

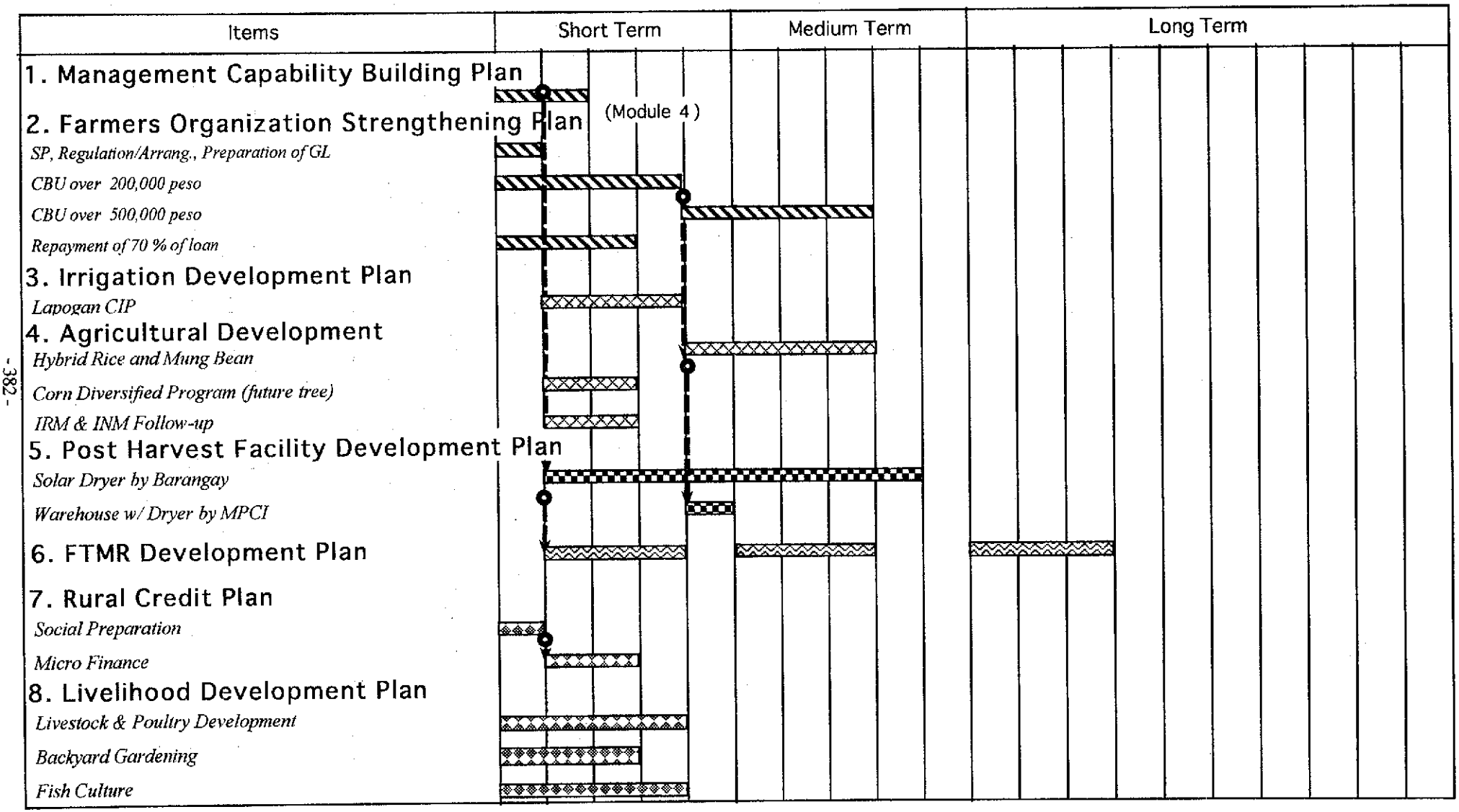
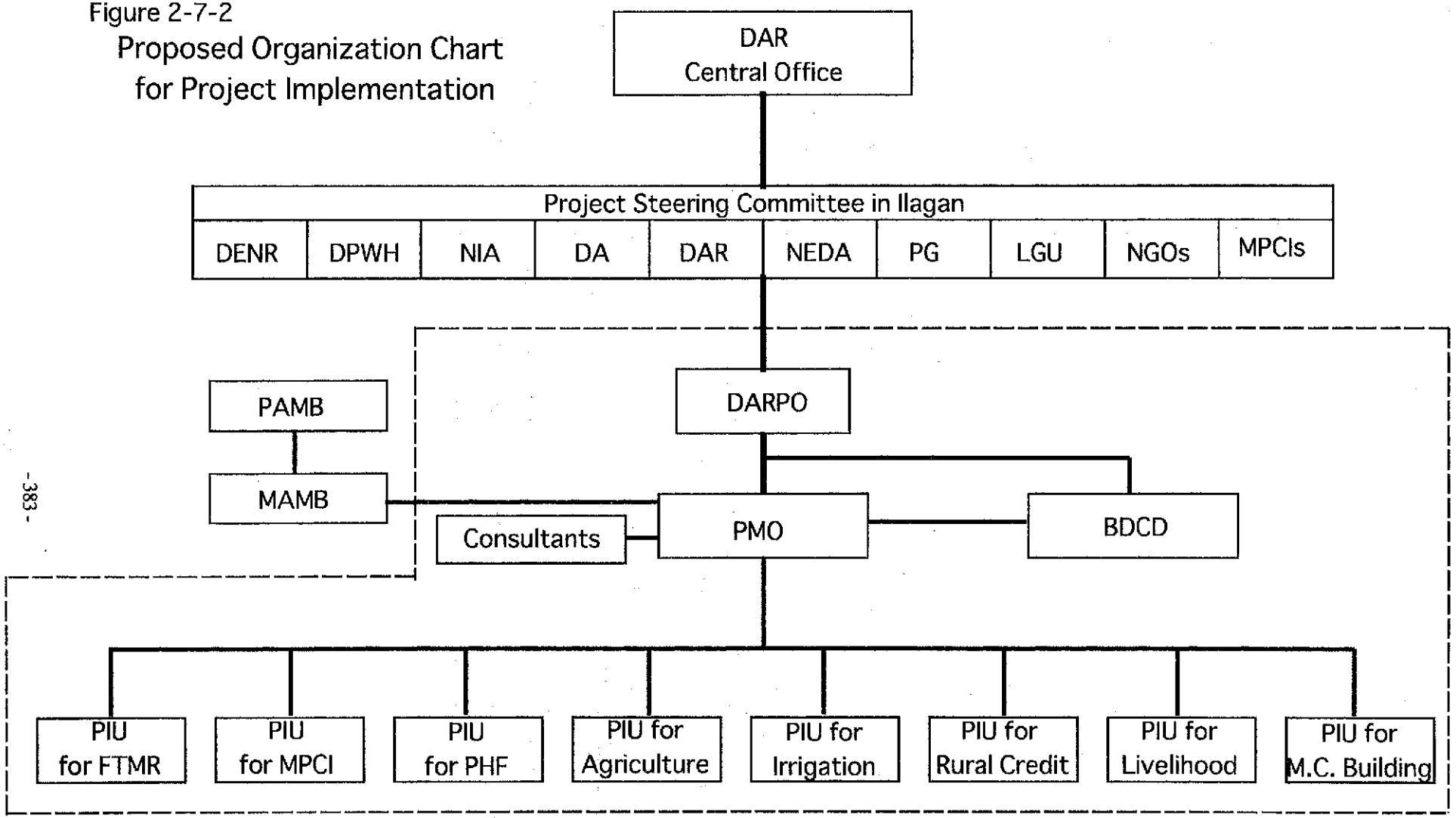


Figure 2-7-2

Proposed Organization Chart for Project Implementation



Note: PMO - Project Management Office
PIU - Project Implementation Unit
PHF - Post Harvest Facilities
FTMR - Farm to Market Road
MAMB - Municipal Agrarian Reform Management Board
PAMB - Provincial Agrarian Reform Management Board
M.C.Building - Management Capability Building
MPCI - Multi-Purpose Cooperative Inc.
BDCD - Beneficiaries Development and Coordination Division
DARPO - Department of Agrarian Reform Provincial Office

2.8 Operation and Maintenance Plan

The proposed irrigation facilities are in a small scale and will be managed and maintained by IA. One (1) year prior to the construction of the irrigation facilities, the following activities will be pursued.

- Before construction, set up of IA, the selection of officers, bookkeeping of income and expenses, understanding the details of the projects, secure of land acquisition, etc. will be included
- During construction, arrangement of labors, managing the progress of the work will be carried out.
- After construction, signing the certificates (including the payment schedule), preparation of the cropping schedule, management and maintenance of the facilities, water management, collection of water charges (including handling of payment and expenses) will be carried out.

In the case of a disaster, rehabilitation works will be executed under the assistance of NIA and PIO. IA has to bear a part of the necessary cost for rehabilitation.

The multi purpose dryer under the Barangay management shall be maintained through the rental charges that will be collected from the users. Barangay will decide the amount of the rental charge. They shall be kept in "Special Account of Solar Dryer" and used shall be utilized for the repair of the facility as necessary.

The management and maintenance of the warehouse shall be managed and maintained by the MPCI.

LGU will be in charge of the management and maintenance of the roads, and beneficiaries of the farm road shall be responsible for the expenses of fuel for a machine, supply of labor and snack under the existing rule of LGU.

2.9 Project Cost

The unit costs and prices are determined considering the recent projects executed by the line agencies and NGOs in June 2000.

Exchange rate based on an average rate for three months from March to May 2000 was applied for this estimate.

1.0 US$ = 42.0 pesos = 106.0 yen

For cost estimate, the following assumptions are applied:

Administration Cost: 8 % of direct construction cost

Physical Contingency: 10 % of costs such as direct construction cost, administration cost

For estimate of price contingency, the annual price escalation rate of 2.0 % for the foreign currency portion is used based on the average rate for advanced five (5) countries. The annual price escalation rate of 9.4 % for the local currency portion used is based on the average rate for one (1) year from July 1998 to June 1999.

The total project cost amounted to 196.11 million pesos. The necessary project costs by short, medium and long term development period are 155.12 million, 29.33 million and 11.67 million pesos, respectively. (refer to Table 2-9-1)

The operation and maintenance costs consist of fuel costs and electricity of facilities, repair cost of the offices and labor cost, O&M and general management costs. For physical contingency, the assumption applied is 10 %.

The necessary operation and maintenance costs by short, medium and long-term development period are 407 thousand, 1,430 thousand and 2.99 million pesos, respectively. (refer to Table 2-9-2)

Table 2-9-1 Project Cost

' unit : '000 pesos

Development Plan	Quantities	Short Term			Medium Term			Long Term			Total		
		LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Agriculture Development Plan		24	0	24	7	0	7	0	0	0	31	0	31
1.1 Hybrid Rice and Mungbean introduction	1 L.S	3	0	3	7	0	7	0	0	0	10	0	10
1.2 IPM &INM Training	1 L.S	17	0	17	0	0	0	0	0	0	17	0	17
1.3 Crop Diversification (perennials)	1 L.S	4	0	4	0	0	0	0	0	0	4	0	4
2. Irrigation Development Plan													
2.1 Lapogan CPIP	325 ha	13,377	41,869	55,246	0	0	0	0	0	0	13,377	41,869	55,246
3. Post-Harvest Development Plan		6,295	3,992	10,287	5,322	3,676	8,998	0	0	0	11,617	7,668	19,285
3.1 Solar Dryer by Barangay (1)	6,146 sq.m	2,661	1,838	4,499	0	0	0	0	0	0	2,661	1,838	4,499
3.2 Solar Dryer by Barangay (2)	12,292 sq.m	0	0	0	5,322	3,676	8,998	0	0	0	5,322	3,676	8,998
3.3 Solar Dryer by Cooperative	6,341 sq.m	2,746	1,896	4,642	0	0	0	0	0	0	2,746	1,896	4,642
3.4 Mechanical Dryer	80 sq.m	400	44	444	0	0	0	0	0	0	400	44	444
3.5 Warehouse	305 cavan	488	214	702	0	0	0	0	0	0	488	214	702
4. Farm-to-Market Road Development Plan		365	348	713	511	487	998	423	404	827	1,299	1,239	2,538
4.1 Farm to Market Road (1)	2.5 km	365	348	713	0	0	0	0	0	0	365	348	713
4.2 Farm to Market Road (2)	3.5 km	0	0	0	511	487	998	0	0	0	511	487	998
4.3 Farm to Market Road (3)	2.9 km	0	0	0	0	0	0	423	404	827	423	404	827
5. Farmers' Organization Development Plan	1 L.S	629	167	796	122	3	125	0	0	0	751	170	921
6. Rural Credit Plan	1 L.S	0	0	0	885	707	1,592	1,884	1,012	2,896	2,769	1,719	4,488
7. Livelihood Development Plan		199	0	199	0	0	0	0	0	0	199	0	199
5.1 Livestock & poultry development	1 L.S	164	0	164	0	0	0	0	0	0	164	0	164
5.2 Backyard gardening	1 L.S	7	0	7	0	0	0	0	0	0	7	0	7
5.3 Fish culture	1 L.S	28	0	28	0	0	0	0	0	0	28	0	28
8. Management Capability Building Plan	1 L.S	162	396	558	10	40	50	0	0	0	172	436	608
9. Operation and Maintenance Equipment	1 L.S	1,080	8,515	9,595	0	0	0	0	0	0	1,080	8,515	9,595
10. Consultant Service Fee	1 L.S	10,740	26,040	36,780	887	2,922	3,809	0	0	0	11,627	28,962	40,589
Sub-Total		32,871	81,327	114,198	7,744	7,835	15,579	2,307	1,416	3,723	42,922	90,578	133,500
Administration Cost (8%)		2,629	6,506	9,135	620	626	1,246	185	113	298	3,434	7,245	10,679
Sub-Total		35,500	87,833	123,333	8,364	8,461	16,825	2,492	1,529	4,021	46,356	97,823	144,179
Physical Contingencies (10%)		3,550	8,784	12,334	836	847	1,683	250	154	404	4,636	9,785	14,421
Sub-Total		39,050	96,617	135,667	9,200	9,308	18,508	2,742	1,683	4,425	50,992	107,608	158,600
Price Escalation		13,532	5,920	19,452	9,411	1,407	10,818	6,779	465	7,244	29,722	7,792	37,514
TOTAL		52,582	102,537	155,119	18,611	10,715	29,326	9,521	2,148	11,669	80,714	115,400	196,114

Table 2-9-2 Operation and Maintenance Costs

' unit : '000 pesos

Development Plan	Short Term			Medium Term			Long Term			Total		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Irrigation Development Plan	338	0	338	825	0	825	1,650	0	1,650	2,813	0	2,813
2. Farmers' Organization Development Plan	15	0	15	3	0	3	0	0	0	18	0	18
3. Rural Credit Plan	0	0	0	319	0	319	638	0	638	957	0	957
4.Others	18	0	18	153	0	153	437	0	437	608	0	608
Sub-Total	371	0	371	1,300	0	1,300	2,725	0	2,725	4,396	0	4,396
Physical Contingencies (10%)	36	0	36	130	0	130	274	0	274	440	0	440
TOTAL	407	0	407	1,430	0	1,430	2,999	0	2,999	4,836	0	4,836

2.10 Project Evaluation

2.10.1 Farm Budget Analysis

Farmers at the Lapogan ARC also earn most of their income from the production of paddy and corn in both wet and dry seasons. The farm budget analysis of these major crops at Lapogan is shown in Tables J-60A to J62A in Appendix J. Other minor crops produced at Lapogan ARC are fruits, namely, banana, calamansi, avocado, santol, guyabano and mango. Livestock production raised at Lapogan are hog and cattle fattening, and backyard poultry raising. The farm budget analysis of all these minor crops as well as backyard livestock raising are shown in Tables J-4A to J-29A in Appendix J.

The net production values (NPV) of most annual crops (rice, corn, beans, vegetable) are also positive. Fruits with high investment in the first year and zero earning in the following 4-6 years give negative NPV for all these vegetative years, and positive for the remaining years. The NPVs of backyard livestock production which require high investment in the first year, also give negative NPV in the first year and very high NPV later on.

2.10.2 Project Evaluation

(1) Financial Analysis

The financial analysis of the Lapogan ARC is also based on the same set of assumptions as those of the Quiling ARC. The financial analysis of the Lapogan ARC also indicates an acceptable FIRR of 23 % for the Low case and 36 % for the High case. Their Net Present Worth at 15% opportunity cost of capital are 31.33 and 71.12 million pesos, respectively.

The sensitivity tests of the low-case FIRR indicate its acceptable but weaker resistance to reduced benefit (11 %), increased production cost (19 %) and increased project costs (35 %) than those of the Quiling ARC. Those of the High case are 25 % decrease in production benefit; and more than 50 % for both the increased production and project costs.

(2) Economic Analysis

Economically, there are two ways of deriving the Economic Internal Rate of Return (EIRR) of a project. One is to apply the Standard Conversion Factors (SCF) to the financial prices of all inputs and outputs used in the analysis. The other is through applying the Shadow Exchange Rate (SER). Algebraically, the relation between the SCF, SER, the Official Exchange Rate (OER) and the Foreign Exchange Premium (FX) are as follows:

$$SER = OER \times (1 + FX\ premium) = OER/SCF$$

$$SCF = 1/(1 + FX\ premium) = OER/SER$$

While SCFs are generally used for an internationally financed project, the requirement of the

NEDA/ICC is that the SERs be used in deriving the EIRR to any project submitted for its consideration. The suggested values of the two are currently given by NEDA are given below;

Variables	International Standard	NEDA/ICC
1. Foreign exchange rate	OER	Shadow exchange rate
2. Conversion factors	SCF	SER
3. Tradable items	SCF = 1.0	SER= 1.2
4. Non-tradable items	SCF = 0.8	SER= 1.0
5. Unskilled labor	SCF = 0.6	SER= 0.6

The two (2) major food grains in the Lapogan ARC, namely, rice and corn, are regarded as tradable items in the economic analysis of this report.

Apart from the EIRR calculated on the basis of the SER, another sets of EIRR calculated based on the SCF are as follows. In general, the EIRRs derived from the two factors are very close. Possible deviations from each other are due to the different proportion of the tradable and non-tradable inputs applied and output produced. (refer to Table J-76C in Appendix J)

Results of EIRR Calculation (%)

Case	Lapogan ARC	
	w/ SER	w/ SCF
Low	17	18
High	28	30

2.10.3 Financial Viability of Implementing Agencies

The financial viability of the Tumanuini Municipality, where the Lapogan ARC is located, in terms of its Net Loanable Allowance (NLA) as shown in Table J-76A in Appendix J, is also higher than the proposed project development costs in every year, except in the third (3rd) year of the project when the proposed project cost is 41.16 million pesos against the NLA of 39.07 million pesos.

2.10.4. Initial Environmental Examination (IEE)

The proposed ARC development plan consists of the agriculture development, irrigation development, post-harvest development, farm-to-market road development, farmers' organization development, rural credit, and livelihood developments and management capability building. The development plans are covered by the environmental checklist. (refer to Table 2-10-1)

These development plans will not have serious impact on the present environment condition, because the development plans proposed are small in scale. Consequently, Environmental Impact Assessment (EIA) is not necessary. The impacts of the proposed ARC development plans are presented as follows:

(On Socio-Economic Environment)

- Income gap is observed between developed and undeveloped ARCs. However, the proposed development plans when implemented will reduce the gap.

- Existing system/custom and social structures will gradually be changed by the farmer's organization development plan. However, since the development plan will only strengthen the existing multi purpose cooperatives, the impact may not be extensive.

If the existing farming practices will continue, it will have a negative impact on the existing environment. The following environmental conservation measures will be considered in the implementation of the proposed development plans:

- Extension of Integrated Pest Management (IPM) to decrease utilization of chemicals and pesticides.

Table 2-10-1 Environmental Checklist

Activities of Construction / Environmental Issues	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Cumalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
I. Socio-economic Environment													
1. Social Life													
(1) Living													
- Planned resettlement													
- Non-spontaneous resettlement		C	C	C	C	C	C	C	C				
- Change in life style	C	C	C	C	C	C	C	C	C	C	C	C	
- Friction among inhabitants	C	C	C	C	C	C	C	C	C	C	C	C	
- Indigenous people / Minority / Nomad													
(2) Population													
- Population increase													
- Sudden change in population composition													
(3) Economic activities													
- Shift of economic activity base	C	C	C	C	C	C	C	C	C	C	C	C	
- Shift in / economic activities unemployment	C	C	C	C	C	C	C	C	C	C	C	C	
- Expansion of economic gap	B	C	C	C	C	C	C	C	C	B	B	B	
(4) Institution / Custom													
- Resettlement of water right / fishery right		B	B									C	
- Change in social structure (e.g. organization)	C	C	C	C	C	C	C	C	C	B		C	
- Restructuring of existing system / custom	C	C	C	C	C	C	C	C	C	B		C	
2. Health / Sanitation													
- Increase in pesticide use	C											C	
- Outbreak of endemic disease	C	C	C	C	C	C	C	C	C			C	
- Spread of infectious illness	C	C	C	C	C	C	C	C	C			C	
- Accumulation of residual toxic (e.g. pesticides)													
- Increase in waste / excrement													
3. Historic spot / Cultural heritage / Scenery													
- Damage and destruction of historic spot / cultural heritage		C	C	C	C	C	C	C	C				
- Loss in important landscape or scenery	C	C	C	C	C	C	C	C	C			C	
- Impact to buried cultural assets		C	C	C	C	C	C	C	C				

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear
▨: not applicable

(Continue)

Table 2-10-1 (Continued)

Activities of Construction / Environmental Items	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
II. Natural Environment													
4. Valuable life / ecological area													
- Change in vegetation	C	C	C	C	C	C	C	C	C			C	
- Impact to scarce or specific animal or plant species													
- Diversity of species	C	C	C	C	C	C	C	C	C			C	
- Penetration / Propagation of a harmful life	C	C	C				C	C	C			C	
- Extinction of wetland / peat bog													
- Extinction of tropical forest / wild land													
- Destruction of mangrove forest													
- Destruction of coral reef													
5. Soil / Land													
(1) Soil													
- Soil erosion	C											C	
- Salinization of soil	C											C	
- Fall in soil fertility	C											C	
- Soil contamination	C	C	C				C	C	C			C	
(2) Land													
- Land degradation (including desertification)	C	C	C				C	C	C			C	
- Hinterland degradation	C	C	C				C	C	C			C	
- Land subsidence	C	C	C	C	C	C	C	C	C			C	
6. Hydrology / Water quality													
(1) Hydrology													
- Change in surface runoff	C	C	C	C	C	C	C	C	C			C	
- Change in groundwater runoff / level	C	C	C	C	C	C	C	C	C			C	
- Inundation / Flood	C	C	C	C			C	C	C			C	
- Soil deposit	C	C	C				C	C	C			C	
- Fall in riverbed													
- Shipping													
(2) Water quality / Water temperature													
- Water pollution / degradation	C	C	C	C	C	C	C	C	C			C	
- Eutrophication	C	C	C	C	C	C	C	C	C			C	
- Change in salt-water													
- Change in water temperature	C	C	C	C	C	C	C	C	C			C	
(3) The air													
- Air pollution	C	C	C	C	C	C	C	C	C			C	

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

▨ : not applicable

Chapter3

Minagbag ARC

Chapter 3 Minagbag ARC

3.1 Category of the ARC

Based on the ARC classification and clustering, Minagbag ARC is categorized as follows:

Area	Geographic Condition	Possibility of Irrigation Development	Current Irrigation Facilities	LTI (%)	Strategic Vitality of Farmers Organizations: Current Condition and Motion
Developing Area	Mixture of flat and hilly	Yes	Not fully equipped	90	Low vitality and moving upward

3.2 Present Conditions and Problems

3.2.1 Agriculture

(1) Present Conditions

The ARC having a total farmlands of 909 ha, has still remaining 1,630 ha unused land. Its topography is gently undulating and its slope has no trees extending toward the north and the east of the ARC. Rice is grown in a 390 ha under irrigation and 77 ha under rainfed condition. Corn is grown at 400 ha. An average land holding is 2 ha per farmer. Soils are clayey loam and soil erosion occurs at the undulated areas.

Rice is grown twice a year under irrigation from June to October, and from December to April. Rice yields is 75 cavan/ha during the wet season and 100 cavan/ha during the dry season. Rainfed rice yields merely 45 cavan/ha. The total palay production in the ARC is 71,715 cavans (3,586 MT)

Corn is also grown twice a year from April to August (wet season) and from November to March (dry season), with a yield of 86 and 65 cavan/ha, respectively. The ARC produces 60,400 cavans (3,020 MT) of corn in a year. Vegetables and fruit trees are grown at the backyard, and eggplant and bitter gourd are sold to the local market. Animals are raised at the homestead in a small scale, as well. Main farm products in this ARC are as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Total (cavan)	Total (MT)
Rice	467	390	75,45	100	32,715	39,000	71,715	3,586
Corn	400	400	86	65	34,400	26,000	60,400	3,020

(2) Problems

Though most of the paddy is equipped with irrigation system, farmers still want to enlarge irrigated paddy cultivation. RTV disease causes much loss of rice yield. There is no road in the farmland, hence, there is an additional hauling cost of 25 peso/bag of palay. In addition, the quality of rice suffered due to untimely harvest because the thresher can not be carried in the farm on time. Drying facilities are not enough that farmers are obliged to sell their wet grains at lower price. Most of the farmers have loans from private traders for their farm inputs.

3.2.2 Agriculture and Rural Infrastructures

(1) Present Conditions

a) Irrigation Situation

The ARC having 3,952 ha is the largest ARC under this study. The southern part of the ARC is comparatively flat and covered by paddy field irrigated by three (3) branch canals with a total of 9.3 km of the Chico River Irrigation System. Also, there exists the Minagbag Small Reservoir Irrigation System. A small water impounding project by DPWH is under construction at the southern hilly land area now.

b) Post Harvest Facilities

The post harvest facilities available are multi-purpose solar dryers and a warehouse (with a rice mill machine). The activity of the Minagbag MPCI is low. The warehouse owned by MPCI is not being used at present. The Barangay manages the multi-purpose solar dryers and the multi-purpose pavement. The following Table presents the situation of the post harvest facilities

Items	No. of places	Size	Area
multi-purpose solar dryers	22	25 m x 18 m	9,900 sq.m
multi-purpose paving yard	1	50 m x 4 m	200 sq.m
grain storehouse	1	25 m x 15 m	375 sq. m

There is no mechanical dryer in the Minagbag ARC.

c) Farm Roads

The national road from Santiago to Tuguegarao is running in the ARC. The distance from the center of the municipality of Quezon to the center of Minagbag Barangay is about 8 km. The roads in the Barangay are as follows.

Village Road	5.0 km	width 3 to 5 m	almost gravel road
Farm Road	24.0 km	width 1 to 3 m	almost unpaved

The farm roads, though already secured, are not passable during the rain season as their ground level has not been raised thus become easily muddy.

(2) Problems

Although the irrigation system has been fully installed, sometimes the period for the growing of rice and the time of supply of required water do not correspond. As a result, crop production may not come up to the expected quantity. A northern part of the Minagbag ARC may possibly be irrigated with the presence of undeveloped water sources.

The shortage of drying facilities has compelled the farmers to sell the crop without drying thus reducing the income by about 2.0 pesos/kg. The warehouse owned by MPCI is not presently being used due to the low activity of MPCI.

Entry to the ARC during the rainy season is difficult. Therefore, the palay in the rainy season may at not be timely harvested due to the difficulty of bringing the thresher to the farm. If palay does not harvest within the desirable period of one week, the quality of palay deteriorates and sale price comes lower. Even when the threshers are carried into the farmland at high expenses, transportation of the product has to depend on lots of labor through the long, muddy and soft paddy field. The difference in the cost of transport for farmers living near and far from the road is 10 to 20 pesos/cavan. The shortage of passable and good farm road has therefore contributed to the high cost of production of crops.

3.2.3 Farmers' Organization

(1) Present Condition

The ARC consists of two (2) cooperatives; viz Epiphany MPCI in Barangay Abut, and Minagbag MPCI in Barangay Minagbag. The membership of cooperative is 456 at

Epiphany MPCI, 182 at Minagbag MPCI, respectively. Although, they are in a neighboring Barangays, the organizational vitality of cooperative is quite opposite. Epiphany MPCI is one of the most excellent MPCIs in the province that has more or less 20 million pesos of assets and one (1.0) million pesos of business profit annually, while Minagbag MPCI is inactive with more than one (1.0) million pesos of overdue debts.

a) Epiphany MPCI

In order to share scarce common resource, 27 Igorot immigrants who have migrated to the area in 80s established Epiphany MPCI in 1980. At that time, Minagbag MPCI had been established already. Despite this situation, strong independence of the tribe might set up MPCI. After that time on, the cooperative has been increasing in membership and has grown to be one of the biggest cooperatives in the Study Area with more than 480[1] members as of July 2000. The MPCI members are scattering over the municipality and the MPCI is organized widely.

Superiority of the MPCI among all, is as follows:

i) The MPCI has four business divisions[2] with individual policy
ii) The MPCI has transparent record and policies
iii) The MPCI hires a number of staff with salary and incentives
iv) The MPCI is able to negotiate with traders with the same stance

Since the establishment of MPCI, the superior staff in Barangay Abut have been assigned to the BOD. The following businesses have been developed:

1990 Start production loan
1993 Start collective purchasing of farm inputs
1996 Establishment of mini bank
1998 Establishment of consumer store
1999 Establishment of branch consumer store

Stringent rules are set up on the re-lending scheme of MPCI.

① The recipient of loan is asked to submit land titles equivalent to the borrowed amount and nominate a guarantor. In case the borrower failed to pay it, the guarantor has to shoulder the responsibility.

[1] Generally, the coop members rapidly increase right after obtaining loan from the government institutions, however the Epiphany MPCI increases members constantly for the last 10 years.
[2] ① Relending Department, ② Mini-bank Department, ③ Sales Department, and ④ Consumer Store Department.

② The ceiling of loan is twice of CBU owned by borrower.

The background of this growth lies in the three (3) points as follows:

① Penetration of coop's by-laws and policies to the members

Monthly information exchange meeting is being held since the establishment of MPCI. Through this meeting, the members obtain the opportunity to communicate with each other and the cooperative spirit is fostered. Consequently, new entrants are encouraged, while anti-coop members are able to leave freely, so that the MPCI has high "Organizational Vitality" in DCC. At present, this meeting is still carried out chaired by Educational Committee of MPCI.

② Prudent and business-like transaction

Since the main reason for establishing MPCI originates to make business using own CBU, but not loan from outside, the MPCI has not made any transaction before the accumulated CBU reaches to one (1.0) million pesos. The re-lending system equips with strict conditions which are not seen in other MPCIs, while it is operated flexibly in such manner that ceiling of loan is determined depending on one's financial capability[3].

③ Leadership[4]

The coop officials are highly qualified. The elected ten (10) officials at present are all university graduates, or under graduates. MPCI is providing leadership training through CAVALCO and CDA together with coop's mutual training which share the stocked skill and knowledge internally.

Traditionally, the members from Barangay Abut positioned the coop officials and eight (8) out of ten (10) are at it at present. Among preceding coop officials, manager at present is reputable. According to the interviews from knowledgeable people, the high qualification of manager[5] draws up MPCI because the MPCI president only directs the policy and the actual operation be entrusted to the manager.

b) Minagbag MPCI ("Patay" cooperative in the same ARC)

[3] The ceiling of loan in Epiphany MPCI is twice of CBU owned by borrower. Entrance fee (50 pesos) and at least one share of CBU (1,000 pesos) are needed for the entrance of MPCI, but the purchasing of additional share is depending on the capability of the member. Thus, unless the member increase share, the ceiling of loan remains constant at 2,000 pesos.

[4] The result of interviews carried out by random sampling in Barangay Abut also shows that the preceding coop officials have quite high reputation and absolute trust from villagers. However the villagers do not point out specific official for the fame and tend to give high respect to whole officials who have been assigned during same period.

[5] The character of the manager is as follows: i) He is not rich farmer and owns only 1.2 ha of irrigated rice field. Farm income accruable from this land and incentive from MPCI (700 pesos per month) are his major income, ii) Graduated UP, faculty of agricultural economy, iii) Acquainted leadership training from Northern Luzon Federation of Cooperatives and Development Center (NORLUCEDEC) and CAVALCO, and then promulgated the training system inside MPCI that is conducting various kinds of training to members monthly.

Minagbag MPCI was set up in 1988 and it was two (2) years ahead of Epiphany MPCI. The MPCI has been active for a few years, but now they have more than ten (10) million pesos of overdue debt as follows:

The MPCI has the following history:

① Obtained LBP loan coincided with establishing of MPCI in 1989. It was just midst of credit-expansion campaign by LBP and the MPCI could obtain credit without collateral. In light of policy change on rural banking sector, the financial institutions started requesting borrowers to pay for debt rigidly, and consequently, this change has segregated good payers and delinquents.

② The MPCI members has increased to 190 at max, however they have lost their trust to the officials since the leakage of embezzlement made by the officials. Since the officials were composed of relatives, they have united to put their guilt to others.

③ After that time on, while the debt is increasing, the MPCI was not reorganized. DF in charge has been trying to reorganize MPCI for three (3) years, but nobody follows the MPCI officials anymore.

④ A part of members are being stimulated by the success of Epiphany MPCI. Some members would like to revitalize the cooperative and others prefer[6] to transfer to Epiphany MPCI.

(2) Problem

① Lack of know how to cope with MPCI expansion (Epiphany MPCI)

At present, the MPCI is getting bigger and facing on the turning point of management. Low score of "Strategic Vitality" in DCC shows the fact and it deems that the management capability can no longer catch up with the increase of MPCI members. In fact, i) Epiphany MPCI already has expanded members in municipal wide, ii) the communication gap between new members and experienced members[7] is obvious because the members has increased in constant manner, iii) more or less five (5) % of members do not repay loan, and it was not a case so far.

Further, the capability of widening of cooperative does not root in the Study Area, so that the line agencies cannot provide training in forming by-laws and policies for this purpose.

② Lack of facility to support expansion (Epiphany MPCI)

[6] The former officials of Minagbag MPCI are not willing to transfer their members to Epiphany MPCI unless the members are free from debt. Towards this, the members with debt are trying to move to Epiphany MPCI after paying it directly to LBP, but not to MPCI. According to the interviews, some coop officials also mentioned that they would like to move to Epiphany MPCI personally.

[7] The MPCI is holding a discussion for new entrant every Wednesday in order to accelerate mutual communication between new and veteran, however the participation rate for veterans is not high.

Expansion of MPCI and revitalizing Minagbag MPCI needs some sort of facilities, which run short at present. For example, the training center to train more than 450 members at one time is necessary for the area wide cooperative, but it is not consolidated yet.

③ Lack of supporting system to revitalize cooperative (Minagbag MPCI)

As shown later, Minagbag MPCI would like to revitalize under the assistance of Epiphany MPCI. However, DARPO have not been able to take care fully of this cooperative. Accordingly, such cooperative can not obtain any technical support or financial assistance even though they have a desire to revitalize. Especially for this matter, it is anxious to create an economic gap between Barangay Abut and Barangay Minagbag.

3.2.4 Rural Economy

(1) Present Situation

As described above, the Minagbag ARC spans two Barangays and is a complicated case in respect of its ethnic composition and current social situation. The Egolot people making up the Barangay Abut are experiencing a rise, albeit gradual, in their standard of living due to the funding received from the Epiphany MPCI and the earnings from the consumer store. In contrast, the Barangay Minagbag is characterized by a lack of unity among the residents and negligible systems for improving their standard of living. The Minagbag ARC is comprised of the Minagbag and about Barangays, which have a combined population of 3,359 in 465 households (of which four (4) % are ARB households). Land ownership per household averages 2.0 ha. In the Barangay Minagbag, almost all produces are sold to traders. In the Barangay Abut, about 50 % of the total farm produce are sold to the Epiphany MPCI. The sales prices of farm produces are as follows.

Products	Rainy season	Dry season
Palay	7.5 pesos/kg (to private traders) 9.0 pesos/kg (to MPCI)	8.5 pesos/kg (to private traders) 9.5 pesos/kg (to MPCI)
Corn	5.0 pesos/kg (to private traders)	7.0 pesos/kg (to private traders)

Production costs for palay in the wet season, palay in the dry season, and corn average 14,520, 20,700, and 17,235 pesos, respectively, per crop per hectare. Fertilizer has the lion's share of the production cost, accounting for 37 % in the case of dry-season rice. Because of the existence of roads, tractors are used to transport products from the fields to the Barangay. The cost is about two (2) pesos per cavan.

The typical farm employed in the farm budget analysis owned 2.0 ha of land, consisting of one (1.0) ha of palay (with irrigation facilities) and one (1.0) ha of cornfield. The farm budget analysis estimated farm income at 83,500 pesos, off-farm income at 7,500 pesos, and non-farm income at 230 pesos, for a total annual income of 91,230 pesos.

(2) Problems

a) Economic gap within the same ARC

As described above, there is a wide disparity between the two Barangays as regards economic activities. Whereas the Barangay Abut has access to funding and technical support through the Epiphany MPCI, the Barangay Minagbag does not. Moreover, the gap is widening. More specifically, there is estimated to be an income difference of about ten (10) % between the two (2) even in the case of cultivation the same average land area of 2.0 ha.

b) Lagging development of sources of off-farm income

In Barangay Minagbag, where the cooperative is not working effectively, the establishment of livelihood programs to raise the standard of living with the support of government agencies has been lagging, and it is difficult for residents to earn income in ways other than farming

3.2.5 Problems of Supporting Systems and Operations

The BARC was established in 1987. For the past five (5) years, the BARC was inactive because the BARC officials claim to be always busy on their personal matters. According to the BARC officials, they do not need to have a meeting if there is no land dispute problem. This means that even the BARC officials do not recognize what are designated to them; those are not only the handling of the land problems but also the discussing of the supporting services required by the Barangay people and the coordinating and managing of the projects at the Barangay level.

The BDP was prepared in 1999, to cover 1999 to 2003, initially by the Barangay officials, the BARC chairman and the IA officials. The municipal officer(s) assisted them. The ARCDP was prepared in 1999 initially by the Barangay officials and the DF. The Barangay officials took no follow-up activities after the planning of the ARCDP.

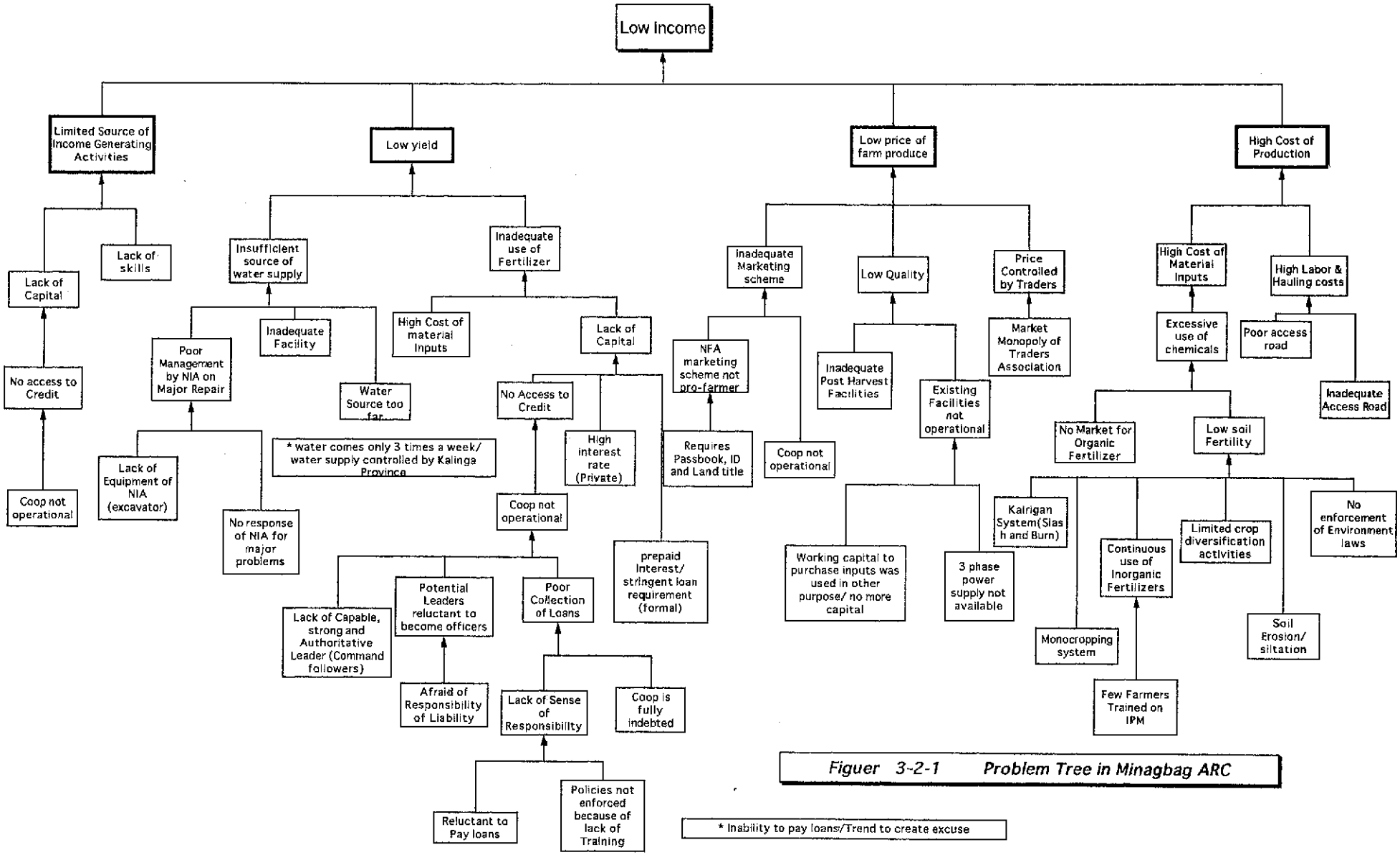
Besides the DF, the agency representatives visited the Barangay were only a few; a) the DA-LGU officer(s) who visited to conduct farming skills training and distribute agriculture inputs, b) the NIA officer(s) who visited at the harvest time to collect irrigation fees, and c) the DPWH officer(s) who visited when infrastructure projects were implemented.

At the municipal level, the MCIT was organized in 1993 and reorganized in 1998.

After it was reorganized, there was neither activity nor meeting. The MARO attempted to convene a meeting a couple of times, but it was failed due to the absence of quorum. This means that the commitments of the MCIT members were low, and it was difficult for the MARO to improve the situation.

3.2.6 Results of the Workshop

The problem tree prepared through the workshop with the Barangay people is shown in Figure 3-2-1. The direct causes of low income identified are: a) limited income generating activities, b) low yield of the farm products, c) low price of the products, and d) high cost of production.



Figuer 3-2-1 Problem Tree in Minagbag ARC

3.3 Diagnosis of Organizational Culture

(1) Positioning in Context of cooperatives in the Study Area

a) Static analysis

At the time of the 1999 Master Plan survey, the Egolot farmers, who make up about ten (10) % of the Barangay Minagbag, became members of the Epiphany MPCI in the neighboring Barangay of Abut[1], partly because of the huge debt and low degree of vitality in the Minagbag MPCI (which clearly belongs to the "Patay" domain). In addition, the membership of the Epiphany MPCI is gradually growing. For this reason, the Epiphany MPCI was selected as a subject for the DCC survey, in the belief that its exclusion would detract from planning accuracy. It was clear from the start that the Epiphany MPCI had an extremely high degree of vitality and great potential to act as a promoter for ARC development as an integrated regional organization (area wide cooperative). As such, it was added to the subjects of this Study[2].

The diagnosis concluded that the Epiphany MPCI had a lower than average degree of “Strategic Vitality” and higher than average “Organizational Vitality”, and therefore belonged to the "Anarchy" domain. The probable reasons are as follows.

i) The Epiphany MPCI is already on a municipal-wide scale and has the most members (more than 450) of all others in the subject area. There are consequently bound to be differences of perspective among the members.

ii) Officials must be trained in order to cope with the increase in membership and physical scale. However, there are no governmental agencies capable of providing training for the management of wide-area organizations.

iii) For these reasons, the atmosphere of communication within the organization is a freewheeling one for rank-and-file members but hard for the management department to keep tabs on. The officials are at a loss about how to implement measures in pursuit of the cooperative's benefit.

The results of the DCC made in year 2000 also indicate that the cooperative members are in an "Anarchy" situation, and that the officials, who do not know what measures should be taken, are in the "Patay" category. Meanwhile, the BOD has a fairly

[1] The Minagbag ARC consists of two Barangays: Minagbag and Abut. The latter was incorporated into the ARC in September 1999, after the signing of the MM for this study. For this reason, Abut is outside the scope of the study.

[2] Even within the group of ARCs categorized by DCC survey, it was decided to make the Minagbag ARC the subject of a feasibility study, partly because the Epiphany MPCI was judged to be the only one with an upward orientation (“Upturn”) as regards organizational dynamics.

high awareness and continues to underpin that of the cooperative as a whole. As for the degree of "Organizational Vitality", the BOD and officials take a passive attitude toward "Respect for Dialogue" and "Appropriate Rules". This suggests a need for urgent measures in correspondence with the increase in the number of members.

b) Dynamic analysis

The cooperative is thought to have an upward orientation ("Upturn" resulted from movement survey), for the following reasons.

i) Interviews conducted with members selected at random found that Egolot from the Barangay Abut had a high opinion of the cooperative as well as a cooperative attitude.

ii) General standards and guidelines have been established, and there have been no violators.

iii) Members are being attracted on the municipality level, and the number is constantly rising. This is linked to a steady increase in CBU.

However, as related in Section 3.2 (on the Present Situation and problems), the Minagbag MPCI is clearly in the "Patay" category in spite of its pledge to revitalize itself at the workshop and hearings conducted in connection with this project. The factors behind the failure of this cooperative may be summarized in the following three points.

i) The lack of standards (bylaw and policies) led to corruption at the top, a lack of a sense of moral obligation for repayment, and lending without collateral.

ii) Activities were launched while the organization was still underdeveloped. As a result, only the officials received the necessary training, and there arose a communication gap between them and the rank-and-file members.

iii) The keynote of governmental policy changed from expansion of rural funding and facilities in the '70s to restraints in the '80s, and credit was offered without a full explanation to the borrowers (cooperatives).

c) Historical development

The Epiphany MPCI grew out of the Ecolot Peasant Cooperative, which was established in 1985 as a farmers' organization based on the teachings of Christianity. At the time, it had 19 members. These members were Egolot people who had moved from the Quezon province to the Barangay Abut. The 19 built up the fund, which started out at 20,000 pesos, and intended to register as a foundation dedicated to mutual aid on the SEC. Eventually, the group was registered as a multi-purpose cooperative on 10 June 1991. Ever since, it has

experienced a smooth increase in both the number of members and CBU amount. At present, its total assets are estimated at over 20 million pesos. Right from the founding, Egolot members have continuously been appointed to the key posts, including president, manager, and accountant. Similarly, the 19-founding members are deeply involved in running the cooperative as BOD members and manager.

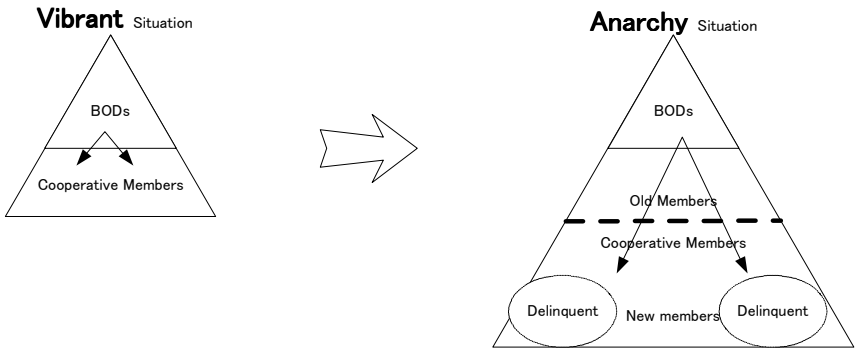
Barangay Minagbag, the other Barangay composing the Minagbag ARC, contains two major factions that arose from ideological differences in the 1970s. At the time, a Philippine army contingent was stationed on the eastern bank of the Barangay with a view to checking the New People's Army (NPA), which was trying to drum up support for its cause in the vicinity. NPA was a communist-inspired organization hoping to overthrow the government, and had convinced residents to boycott government-related projects. Even in the 1980s, Minagbag was marked by confrontation between two groups with anti- and pro-government sentiments, and the division lingers on today. This negative ideological legacy forms part of the background for the neglect of the Minagbag MPCI to pay its debts.

According to NIA, there is a major gulf between Abut, which is populated by Egolot, and Minagbag, whose population consists mostly of Ilocano, about matters such as collection of irrigation fee. The problems between the two are apparently not going to be resolved overnight. There is a certain antipathy stemming from ethnic pride. In addition, Minagbag presumably has feelings of inferiority relative to Abut, which has better organizing capabilities, and is thought to retain strong anti-government sentiment. Nevertheless, the two appear to have become capable of considerable cooperation with each other compared to the past, thanks to the completion of the paved road.

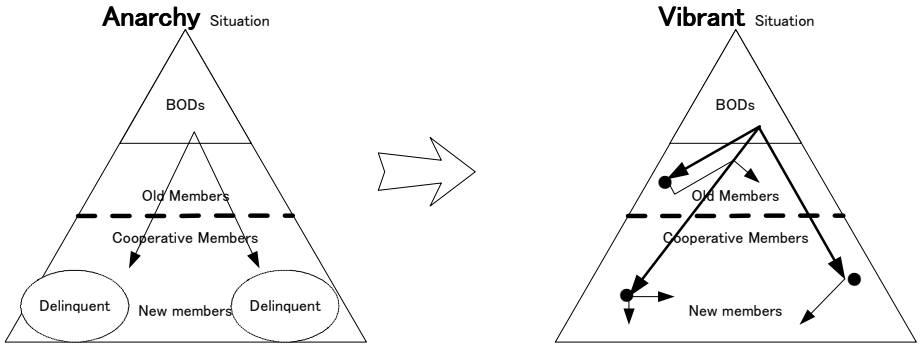
(2) Evolution from "Anarchy" to "Vibrant" and further to "Area wide cooperative" in the case of the Epiphany MPCI

Praised as one of the leading MPCIs in all of Isabela Province, Epiphany MPCI basically should rank in the "Vibrant" domain for its degree of organizational vitality. However, the number of members has been rising because of the success in business, and small Barangay-based communities appear to be taking shape within the cooperative. This is thought to be causing a disunity of outlooks and lowering the degree of “Strategic Vitality”.

Present Organizational Situation of Epiphany MPCI



Revival to Vibrant Situation



Improvement of this disposition requires an expansion of the organizational structure to a more extensive regional scale. As shown above, membership is growing on the municipality level. This demands steps to establish chapters and chapter leaders in the other major Barangays while keeping the center in Barangay Abut. The St. Rose of Gamu Credit & Development Cooperative, which is described as exemplifying an excellent cooperative in Section 4.2.2 of Master Plan (on the potential of farmers' organization development) could serve as a model for the role of chapter leaders. Action along these lines could raise the "Strategic Vitality", which is now sagging, and rebuild the foundation for more extensive CBU collection. The domain for organizational vitality could return from "Anarchy" to "Vibrant" as a result.

Next, the cooperative should attempt to expand its broader scale further. It could be regarded as already on the area-wide level in point of the cumulative CBU, number of members, and business experience. To make its foundation even more solid, it should carry out the following improvements, which would be positioned as

development models in the Study Area.

i) Implementation of training in accounting, auditing, and bookkeeping as required by a area wide organization
ii) Preparation of a training center
iii) Construction of a warehouse
iv) Implementation of professional training for a further expansion of business

The cooperative will probably also need human support for tasks that cannot be executed under the existing system within the Study Area. Options in this connection include use of the services of external auditors to ensure transparency and incorporation of new technology for raising the level of technology in individual businesses.

3.4 Agriculture Development Scheme

3.4.1 Agriculture Development Plan

When the proposed irrigation system is established, new paddy field will be opened at about 45 ha. The total paddy will be 512 ha. Yield of palay is planned to increase through RTV disease control and introduction of hybrid variety, and mung bean will also be introduced in the paddy cultivation. Rice should be protected from RTV disease through the guidance of RCPC and extension workers. It shall be done early at the short term development stage. Hybrid rice and mung bean production shall be introduced through a season long training of PhilRice and extension workers after the completion of the social preparation activities. Hybrid rice will be planted at 110 ha and mung bean at 145 ha at the end of the long term development stage. Through the plan, rice is expected to yield 120 cavan/ha.

Crop diversification is planned in two (2) ways, one is conversion from corn into perennials at 88 ha and another is planting trees at 163 ha of the unused land. Considering both lands are undulating, the crops for diversification are planned to be perennials such as fruit trees and useful trees. Since wide areas will be planted with trees, a community plant nursery is required to provide the necessary seedlings. The plant nursery will be set up on a 0.5 ha within .the ARC. The nursery will be established through the technical support of CVIARC and PENRO (Provincial Environment and Natural Resources Office). The advice and training on plant propagation shall be continued for five (5) years. The nursery will be operated and managed by the Barangay Council and the seedlings shall be sold to farmers at a reasonable price, which is necessary for the maintenance of the nursery. Extension

workers will guide the planting of trees after the third year when the seedlings are ready for re-planting. The cornfield will be reduced from 400 ha to 312 ha. Corn yield will be expected to increase through the IPM and INM training held by RCPC and extension workers at the early stage of the project. Farm production at the end of the long term development stage is planned as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Yield (MT/ha)	Total (cavan)	Total (MT)
Rice	512	435	120	120	61,440	52,200	-	113,640	5,682
Mung bean	0	145	0	0.8MT	0	-	-	-	116
Corn	312	312	80	80	24,960	24,960	-	49,920	2,496
Banana	25	-	-	-	-	-	f 120	-	f 3,000
Mango	5	-	-	-	-	-	7.5	-	37.5
Calamansi	3	-	-	-	-	-	18	-	54
Sweet potato	5	-	-	-	-	-	4.5	-	22.5
Gmelina	113	-	-	-	-	-	-	-	-
Mahogany	50	-	-	-	-	-	-	-	-
Narra	50	-	-	-	-	-	-	-	-

Note: f stands for finger (f '000).

3.4.2 Irrigation Development Plan

(1) Irrigation Plan

The source of irrigation water is the Padapad Creek in the north that flows along the border of the district. The flow discharge data observed by NIA with a current meter in 1996, are shown as follows. The minimum discharge is 13 lit/sec in April.

(unit: lit/sec)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Discharge	98	32	25	13	78	96	138	156	142	131	125	118

Source : NIA-PIO

The evapotranspiration rates were calculated by PENMAN method based on the meteorological data for 30 years at Tuguegarao Observatory. The minimum rate is 4.0 mm/day in January while the maximum 7.9 mm/day in April and May. Crop coefficient rates adopted are between the maximum 1.20 and the minimum 0.94 from the criteria of NIA, and water requirement for land preparation for dry and wet palay were calculated at 233 mm and 317 mm, respectively, from effective soil layer and porosity. The water is to be supplied three (3) times in a month at the depth of 50 mm before plating. As the soil is sticky, percolation is supposed to be 1.0 mm/day. Net unit water requirement is calculated at 8.0 mm/day for the rainy season cropping. Overall irrigation efficiency is to be 0.5 from NIA criteria (conveyance efficiency = 80 %, application efficiency = 90 % watery distribution efficiency = 70%). Therefore, unit water requirement is to be 2.06 lit/sec/ha.

The possible irrigable area is 45 ha from the above discharge and water requirement. A reservoir plan is judged to be unrealistic, and not payable for the cost of the construction because of the very small storage capacity.

(2) Facility Plan

The irrigation facility shall consist of a small pump station, canals and appurtenant structures. The canal network shall consist of a main, lateral and on-farm canals. The canal shall not be lined in general, but on high raised ground or sandy soil where substantial leakage is expected, concrete lined canal or block pavement shall be applied. The appurtenant structures are an intake, drops, road crossing, etc. depending on the needs at site. Along the canal, O&M roads shall be installed and these roads will play a role of farm road function.

a) Pump Station Planning

The irrigation water source of pump station shall depend on the Padapad Creek. The irrigation will cover an area of 45 ha. The water requirement will be 45 x 2,06 lit/ha = 92.7 lit/sec (=3.71 cu.m/min). The gross water requirement with water loss is in 110 lit/sec. The actual lifting head of the pump shall be 3.13 m based on the low water level of the Padapad Creek and delivery water level. The total head will be 5.23 m including the friction loss in the pipes. The pumps shall be applicable to both constant and peak-time operation. In preparation for repair work, the load of the pump will be divided into two (2) same size pumps. Two (2) pumps shall be vertical with a diameter of 200 mm driven by two (2) engines of 7 ps.

b) Canalization

The length of the irrigation canal shall be 1.66 km with ancillary works of two (2) diversion works, a drop and a road crossing. (refer to the attached drawings).

(3) Water Management System

The distribution of irrigation water will be controlled by rotational irrigation system (one rotation block is less than 10 ha because of its complicated geography) on the basis of the agreement among farmers in the block. The rotation interval is seven (7) days at the longest. The on farm canal will be classified into the main farm ditch and farm ditches. The average area covered by the farm ditch is 1/7 of a block area.

3.4.3 Post Harvest Facility Development Plan

(1) Objectives

The post harvest facility composing of the multi purpose solar dryers, a warehouse, and a mechanical dryer, aims at the improvement of quality of the crop and increase in farmer's income of through timely sale of the crop at an advantageous price.

(2) Facility Plan

The facility will have the capacity to dry a part of crop produced within the ARC area. The amount of produce to be stored shall be 20 % (16,200 cavans) of the total planned produce. The proposed floor area of the warehouse will be 240 sq.m. Grains to be stored in the warehouse will be dried at the attached drying facilities for long storage. About 75 % of the stored amount (15 % of the total production amount) will be dried at the solar dryers. The rests is dried by a mechanical dryer, and its capacity is 120 cavan/day.

The plan of the post harvest facilities is shown as follows. (refer to Appendix F)

In-charge	Kind of Drying Facility	Ratio	Planned Palay	Drying Amount	Area
		(%)	(cavan)	(corn cavan)	(sq.m)
private	garden	15	8,406	3,744	10,001
Barangay	multi-purpose solar dryer	65	36,246	16,224	43,381
Cooperative	multi purpose solar dryers	15	8,406	3,744	10,001
	mechanical dryer	5	2,802	1,248	-
Total		100	56,040	24,960	63,403

The Barangay owns an unused area of 2.0 ha. This area will be used for the multi-purpose solar dryers.

(3) Implementation Schedule

In consideration of the progress of capability building of the LGUs and MPCI, the drying facilities will be introduced under the following schedule. For solar dryers in the private gardens, no specific schedule has been made since this belongs to private property. However, the introducing works would be completed within the period of the short or middle term development period. The post harvest facilities that will be managed and maintained by the Barangay will start in the second (2^{nd}) year of the short-term development stage, and be completed during the short/middle term development period. This schedule will commence after the improvement of capability of the Barangay officials, the progress of the ratio of irrigation area and the development of agriculture. The solar dryers and multi-purpose

pavement included both in the Barangay development program are to be constructed at a comparatively earlier stage in the short-term development program.

The warehouse includes a solar dryer and a mechanical dryer, shall be managed and operated by MPCI. The facility shall introduced after MPCI has accumulated a CBU of over 200,000 peso, an indication of progressive activity of MPCI. Therefore, the component will be carried out during the middle term development stage.

3.4.4 Farm to Market Road (FTMR) Development Plan

(1) Objectives

The FTMR will be introduced to effect a timely transport of necessary machines into the farmland, keep the quality of the crop, reduce the hauling cost and increase the income of farmers.

(2) Road Planning

Applying the criteria presented in 6.1.4, Chapter 1, the following roads are planned at the locations prepared for the purpose. The length of proposed roads is shown as follows. (refer to the attached drawing)

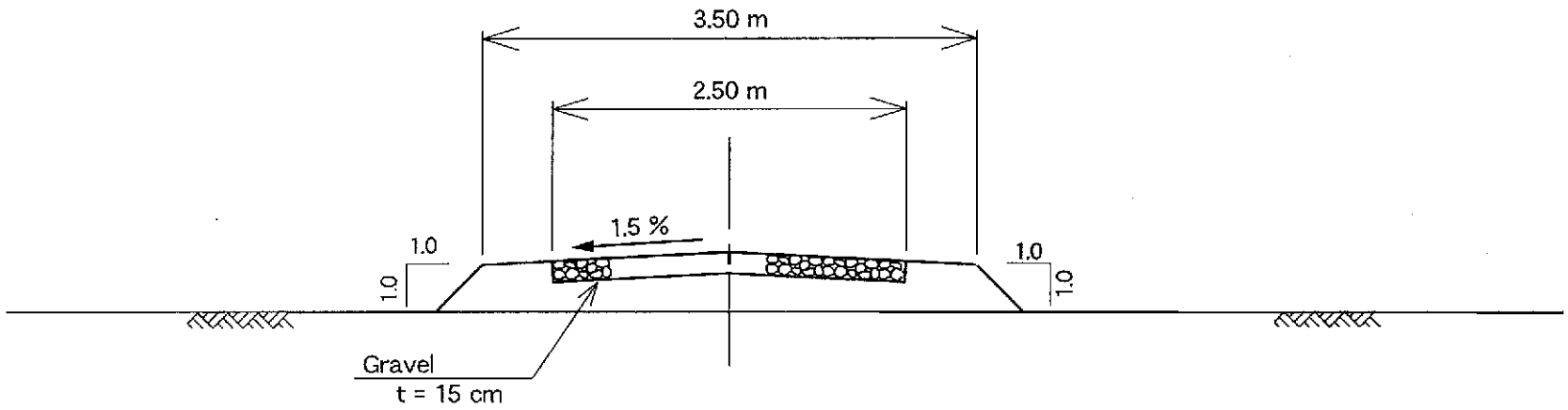
Name of Proposed Road	Proposed Length
Aggasaid to ISF Rd (E 1)	2,655.0 m
Sabado to Rainfed Area (E 2)	900.0 m
Minagbag to Magamot CIP (W 1)	600.0 m
Avwcilla to NIA (1)	1,500.0 m
Valdez Rd (W2)	1,517.5 m
Leal Rd to Padapad (W3)	1,000.0 m
Total	8,172.5 m

These roads lead from the main farm road crossing the village to the farmland. Each road section has a width of 2.5 m and shoulder of 0.5 m on both sides with gravel cover. (refer to Figure 4.1.1 and the section of 6.1.4 in Part 1)

(3) Implementation Schedule

The Barangay will manage the farm road. The capability building program of the LGU will start in the first (1st) year of the short-term development stage. Consequently, the management capability of the Barangay officials for management is expected to improve in the second (2nd) year. The introduction of these farm roads, therefore, will start in the second year at the rate of 1.0 km a year.

Figure 3-4-1 STANDARD DRAWING OF FARM-TO-MARKET ROAD



Production Road

3.5 Farmers' Organization Development Scheme

(1) Direction of Development

At the time of Master Plan Study, about ten (10) % of farm households in Barangay Minagbag belonged to Epiphany MPCI in Barangay Abut[1] because the Minagbag MPCI was inactive with huge amount of overdue debt. Opposite to the "Patay" situation in Minagbag MPCI, Epiphany MPCI has steady member increase annually. Thus, the Diagnosis of Corporate Culture (DCC) survey was conducted at Epiphany MPCI, because the exemption of Epiphany MPCI from the survey seems to lack of preciseness to formulate the overall development plan. From the beginning, Epiphany MPCI was known as one of excellent MPCI with high organizational vitality, so that it was considered that the MPCI would act as the drive of development in the Study Area and play an important role[2] as an area-wide cooperative in the nearest future.

At the time of Master Plan Study, it is recognized by the officials of MPCI and BDC that Epiphany MPCI would shoulder the responsibility as the recipient of developments. However, in the process of re-confirmation to the villagers through a series of workshop and public hearings conducted in the Feasibility Study, changing of opinion was observed as follows:

a) Barangay Minagbag, because the beneficiaries of the Project are the villagers, are hoping to be an independent recipient of the Project being supported by Epiphany MPCI. Accordingly, the MPCI expressed the will of recovery from "Patay" condition. They have proclaimed to all participants of the public hearing that they will re-elect BODs and identify who have debt, and then, they will pay debt from LBP.

b) Epiphany MPCI and Barangay Abut promised to support the development of Barangay Minagbag in terms that they will accept the debt-free and paid-off villagers, and provide technical training to MPCI on accounting and credit management.

In the light of a) above, the members of Minagbag MPCI will transfer to Epiphany MPCI and procure necessary production loan during the coop's repayment period to LBP. When all the debt repaied[3], the villagers of Barangay Minagbag will discuss again as for whether the cooperative is sustained or merged by Epiphany MPCI. In case of merger, the branch office of Epiphany MPCI will be established in Barangay Minagbag, and the

[1]Minagbag ARC is composed of two Barangays, namely Barangay Minagbag and Barangay Abut, however the latter was incorporated to the ARC just on September 2000, and it was after the signing of M/M of this Study. Therefore the Study formally does not cover the territory of Barangay Abut.
[2]Epiphany MPCI was classified into "Anarchy" in DCC survey, but it only showed "Upturn" in movement survey. This is one of the reasons Minagbag ARC was selected as a model ARC in this Study.
[3]According to the estimation by JICA Study Team, 15 years are necessary to repaydeebt.

villagers will compose the membership in sound manner.

Thus, as for the formulation of development plan for Minagbag ARC, it is ideal that Minagbag MPCI should serve as a recipient of the development on the condition that Epiphany MPCI would provide necessary technical training to it. While toward Epiphany MPCI, it is recommended to provide the necessary software in order not only to support Epiphany MPCI, but also to form the vanguard as the area-wide cooperative in the Study Area.

(2) Objective

The objective of development is to increase organizational vitality of Epiphany MPCI from "Anarchy" to "Vibrant" and then, to "Area-wide Cooperative" in order that the MPCI can provide various kind of support not only to Minagbag MPCI but also to nearby MPCIs.

(3) Contents

1) Support of troubleshooting on existing problem should be made. DARPO and LBP should form a task force to assist in formulating a loan repayment scheme for Minagbag MPCI.

2) Support for innocent members of Minagbag MPCI to transfer to Epiphany MPCI is accelerated.

3) It is necessary to construct of training center equipped with presentation facilities for Epiphany MPCI. The training center should be used in public manner, thus DARPO should discuss with Epiphany MPCI as for the preconditions.

4) Establishment of palay trading center at Epiphany MPCI should be planned after the MPCI repays 70 % of existing loan and accumulative CBU exceeds 1,000,000 pesos. It is estimated to realize after the year 2007. MPCI will own a warehouse with a mechanical dryer. The MPCI will buy palay not only from the members but also from adjacent MPCIs. Planning of the facility is commenced one year before construction.

5) It is recommended that the establishment of network with other good standing MPCIs after ten (10) years time, and start barter trading with counterparts. For example, Epiphany MPCI forwards goat meat, and instead the counterpart hauls vegetables and fruit.

(4) Implementation Schedule

Component	Description	Outputs/Returns	Agency	Conditions to be implemented
<Short Term Development Plan>				
(1) Minagbag MPCI				
Trouble shooting	Loan repayment	Reimbursement Schedule	DAR, LBP	SP should be continued
Credit Management Training	For non-pay members		LBP, DAR	Supported by Epiphany MPCI
Innocent members to transfer to Epiphany MPCI	Members with no debt to get a membership of Epiphany MPCI	Synchronize active and non-active MPCIs	DAR	Agreement between 2 MPCIs
(2) Epiphany MPCI				
Increase member and expand coop size	Promotion campaign	Increase CBU toP10,000,000		Absorb the innocent villagers of Minagbag
Training Center	Dispatch expert with equipment	Training of nearby coop	DAR	DAR requests foreign assistance
Advanced training	Accounting, auditing		LBP, DAR	
<Medium Term Development Plan>				
(1) Minagbag MPCI				
Revision of co-operative by-Law	Including policy on loan repayment	Formulation of coop regulations	DAR,NGO	If necessary, the coop should be reorganized
(2) Epiphany MPCI				
Wear house	Coop owned land at 8,000sqm	Activation of palay trading	LBP loan	After repay 70% of existing loan
<Long Term Development Plan>				
(1) Minagbag MPCI				
Increase member and expand coop size	Promotion campaign	Increase CBU toP150,000		If desired by villagers
(2) Epiphany MPCI				
non				

(5) Support System

To strengthen management capability, the following training should be applied.

1) Social Preparation to find out new leader who will revive Minagbag MPCI including leadership training to aspiring leaders (by DARPO: continuously four (4) to five (5) years)

2) Credit management at Minagbag MPCI by LBP, DARPO, and Epiphany MPCI (3 times a year)

3) Advanced training on accounting, auditing, and bookkeeping at Epiphany MPCI by CAVALCO (3 persons x 2 weeks x 2 years)

4) Technical training and support on cooperative management at Epiphany MPCI

(continuously eight (8) years). This should be supported by the expert[4] assigned by DARCO.

3.6 Development Support Scheme

3.6.1 Rural Credit Plan

The MPCI should concentrate on paying debt during Short Term Development period. Minagbag MPCI should firstly clarify the amount of total debt and then formulate the disbursement schedule for the debt, which should be paid at least even 10 % during the Short term Development period. Since the payable amount is huge and needs long years to complete the obligation without any financial support during the period, it is recommended that Microfinance (MF) be applied to the members who have to pay loan during this period. MF should be provided to female organizations (Minagbag RIC) continuously, until 70 % of the total debt is paid.

On the other hand, it is not necessary to provide special arrangement for rural credit to Epiphany MPCI, because even though the new entrants who are free from debt join the cooperative from Minagbag MPCI, Epiphany MPCI with proper system and enough financial capability is judged to be credible. Since Epiphany MPCI is expected to form a core of GPC, it is recommended to dispatch suitable experts and strengthen the organization, and then from Medium Term Development period, the GPC should start operation based on this MPCI.

3.6.2 Livelihood Development Plan

Livelihood development plan in the ARC includes livestock & poultry development, backyard gardening, fish culture and mushroom culture. Considering it is required to improve the home economy as soon as possible, these projects will be put into practice in the first year in the Short Term. Animals such as cattle/Carabao, swine, goat and poultry will be raised under the livestock & poultry development plan. It will employ a revolving method, called 'Animal Dispersal Plan'. An NGO will lead the project in the first (1st) year of the Short Term Development stage, and the Barangay Council will manage it later. The backyard gardening will be disseminated to women in the ARC. The proposed demonstration farm shall be established one each at a Purok, to given with practical training by an extension workers, and the skills will be disseminated to other farmers. The extension workers will provide seed for

[4] Expert(s) proposed in the Master Plan will be assigned for technical support. Expert(s) will station at Epiphany MPCI and render services to the cooperatives being spread in municipality.

demonstration. The project will be carried out in the first three years.

NGO will lead the fish culture. Agricultural extension workers will judge the land topographically, and fishpond will be constructed with Small Fish Reservoir (SFR) project in the first (1st) year. Fish raising will start in the second year with the fry to be provided by CVROSFR free for three (3) years. The grower shall purchase the fry by himself after that period. Mushroom culture will also be extended to women practically with the skills taught by extension workers. The extension workers shall be trained first at RCPC. This project will be executed from the first year. The seed fungus will be provided by RCPC for free in the first year, and the growers shall buy it by themselves later.

3.6.3 Management Capability Building Plan

The details of the Plan are shown in 6.3.3 of the Part 1. The objective of this Plan is to increase the management capability of the agencies' staff as well as the farmer beneficiaries through the training for the effective and efficient implementation of the proposed development plans. The training will principally be conducted at the municipality level. The target agencies' staffs are the DARPO's staff, government officials of line agencies and LGUs, NGO staff and so on. The target farmer beneficiaries are mainly Barangay officials. All the training programs will be implemented within two years after the commencement of the project implementation. The impact survey at the end of the second year will review and determine if the training programs need to be continued.

The training programs included in the Plan are: (1) Development Planning, (2) Planning Workshop cum Training, (3) Monitoring and Evaluation, (4) Training to Trainers and (5) Project Management (Social Preparation)

3.7 Project Execution Plan

As shown in 6.8.3 " in Part 1 of this report, the first development priority will given to "Management Capability Building Plan", "Farmers' Organization Strengthening Plan" and "Rural Credit Plan" to improve farmer's and MPCI's management capabilities. Therefore, they should be started before all others plans. "Livelihood Development Plan" will be carried out for individual farmers. Although this will directly contribute to the improvement of living standard of the farmers, there have been several similar projects and there seems no need of specific new instruction and training. These four (4) plans will start at the first (1st) year in the short-term development period.

"Management Capability Building Plan" will be carried out for two (2) years in the short term development period. As the management capability building of the LGU and promotion of agricultural technology to agricultural extension workers will be achieved in the first year. The components managed by Barangay, such as multi purpose solar dryer (including multi-purpose pavement) in the framework of "Prost Harvest Facility Development Plan", "FTMR development" and "Agriculture Development Plan" will follow. "Agriculture development" is to be undertaken with the assistance of DA. The construction of the multi purpose dryer will be promoted with the assistance of LGU who will supply materials, labors and construction machines. Through the process of construction and supervision, the farmers of the Barangay will themselves improve their technology, management and maintenance skill. Considering this, the works will be carried out for the long period. After the improvement of capabilities of LGU, LGUs or the Barangay will carry out FTMR Development on the contract basis. The work will start in the second year like that of the multi purpose dryer.

The MPCI will be in charge of the management and maintenance of the warehouse as well as its construction. In consideration of this, the construction of the warehouse will start at a time when the MPCI is prepared to take up the work, and the CBU has come up to more than 200,000 peso (15th year from the beginning of the short-term development program).

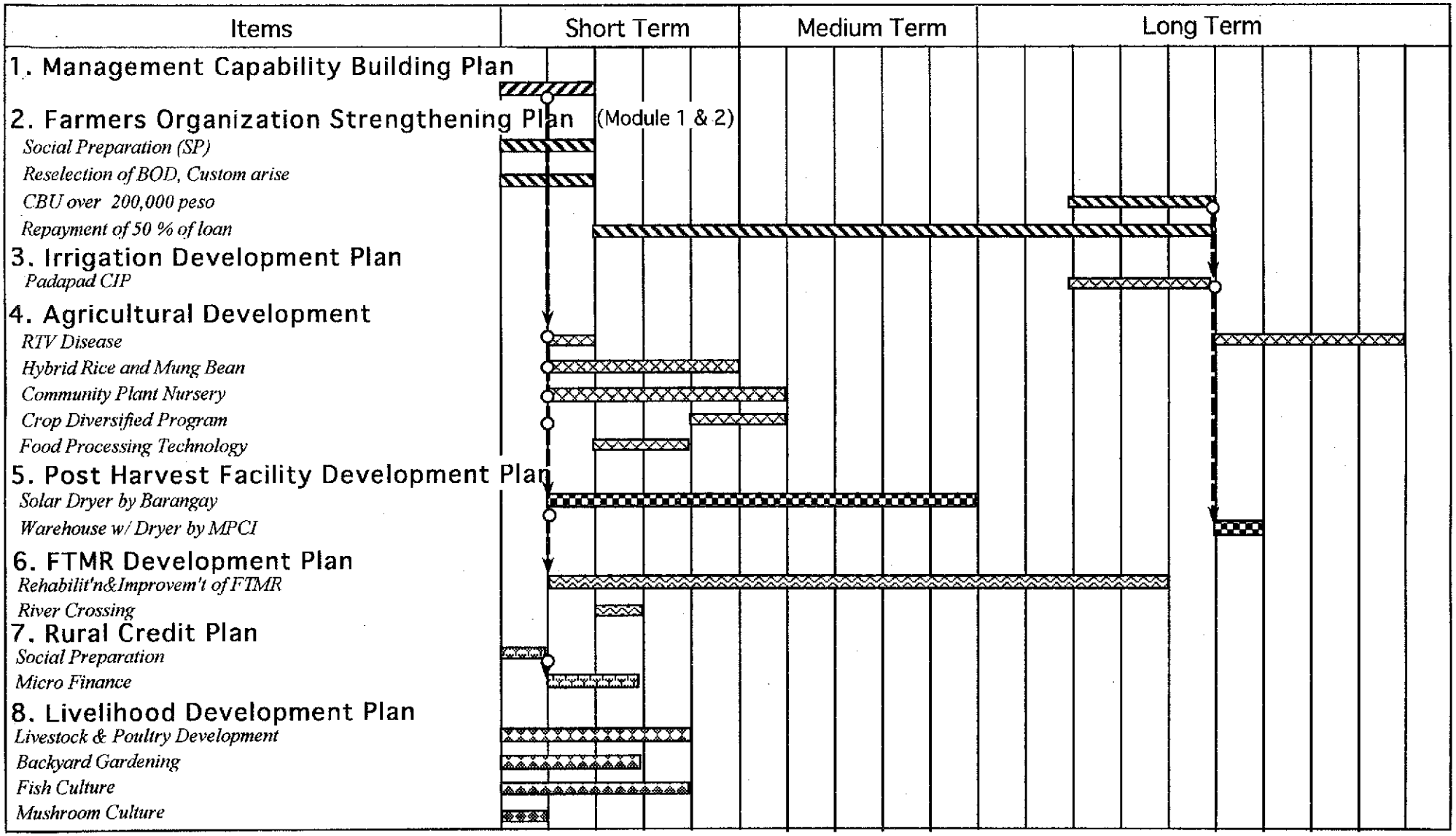
NIA will supervise the design and construction of the proposed irrigation facilities. IA will participate at every stage, in the planning, designing and construction of the proposed facilities. The capability and activities of the IA is expected to improve in accordance with the support and technical assistance of NIA. Therefore, the works will begin after the social preparation, and rules and regulation in MPCI have been established.

The introduction of hybrid rice needs stable supply of water through the irrigation system. As this ARC has already the irrigation system, this is scheduled to start at the beginning of " Agriculture Development Plan". The implementation schedule of each component for the Lapogan ARC is shown in Figure 3.7.1.

Figure 3-7-1

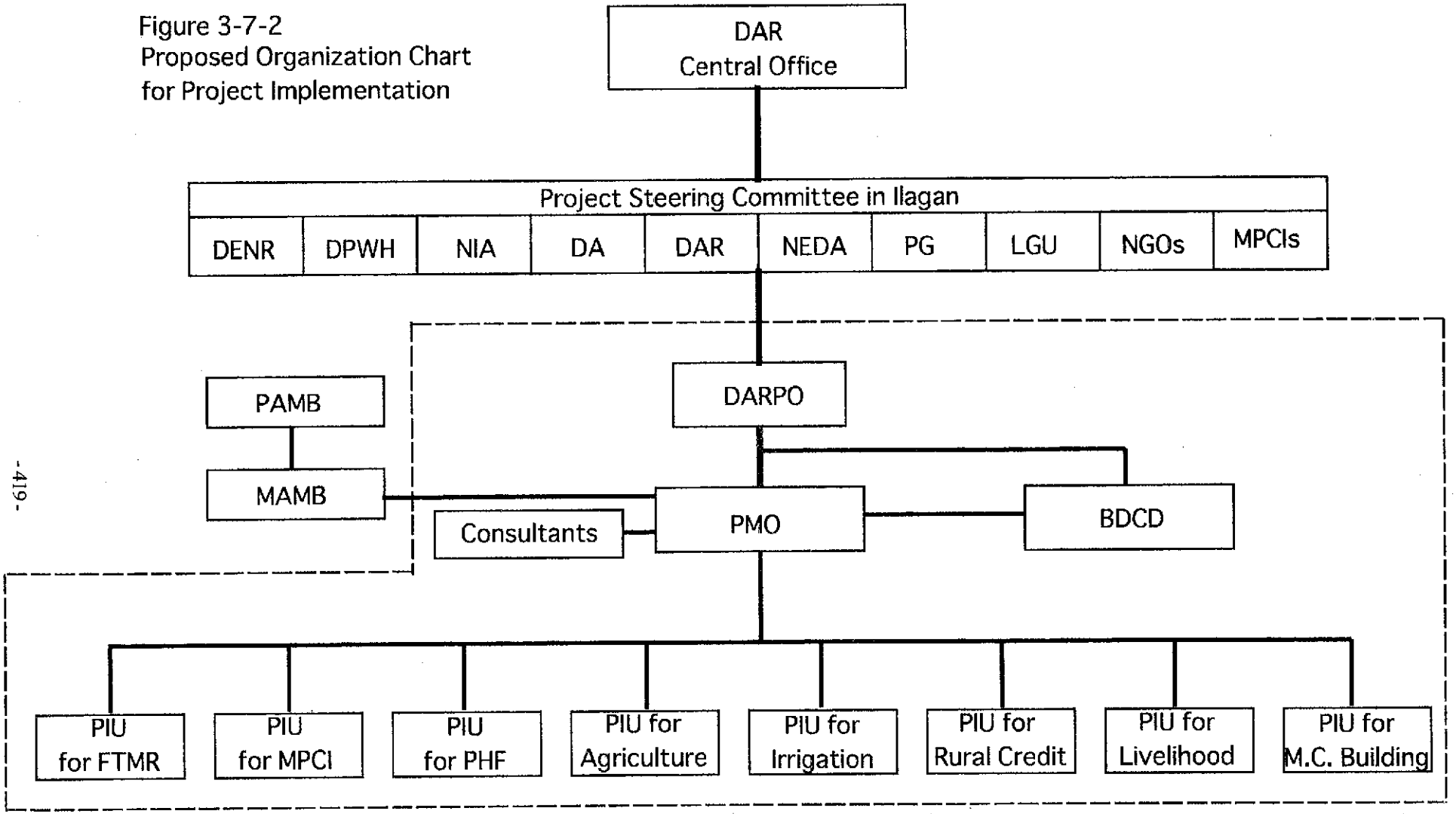
Tentative Implementation Schedule
(Minagbag ARC)

F O: Anarchy ⬆ & Patay ⬇



Source : JICA STudy Team

Figure 3-7-2
Proposed Organization Chart
for Project Implementation



Note: PMO - Project Management Office
PIU - Project Implementation Unit
PHF - Post Harvest Facilities
FTMR - Farm to Market Road
MAMB - Municipal Agrarian Reform Management Board
PAMB - Provincial Agrarian Reform Management Board
M.C.Building - Management Capability Building
MPCI - Multi-Purpose Cooperative Inc.
BDCD - Beneficiaries Development and Coordination Division
DARPO - Department of Agrarian Reform Provincial Office

3.8 Operation and Maintenance Plan

The operation and maintenance of the irrigation facility shall be provided by the Chico River Integrated Irrigation System (CRIIS) office for the main canal and by IA for the on farm facilities under the guidance of CRIIS. Management works of IA include management of the on farm facilities and the following works;

1. Crop pattern and scheduling with assistance from extension workers,
2. Repair works of the on farm facilities, and
3. Guidance for the rotational irrigation and check up illegal water distribution.

The proposed irrigation facilities are in a small scale and will be managed and maintained by IA. One (1) year prior to the construction of the irrigation facilities, the following activities will be pursued.

- Before construction, set up of IA, the selection of officers, bookkeeping of income and expenses, understanding the details of the projects, secure of land acquisition, etc. will be included
- During construction, arrangement of labors, managing the progress of the work will be carried out.
- After construction, signing the certificates (including the payment schedule), preparation of the cropping schedule, management and maintenance of the facilities, water management, collection of water charges (including handling of payment and expenses) will be carried out.

In the case of a disaster, rehabilitation works will be executed under the assistance of NIA and PIO. IA has to bear a part of the necessary cost for rehabilitation.

The multi purpose dryer under the Barangay management shall be maintained through the rental charges that will be collected from the users. Barangay will decide the amount of the rental charge. They shall be kept in "Special Account of Solar Dryer" and used shall be utilized for the repair of the facility as necessary.

The management and maintenance of the warehouse shall be managed and maintained by the MPCI.

LGU will be in charge of the management and maintenance of the roads, and beneficiaries of the farm road shall be responsible for the expenses of fuel for a machine, supply of labor and snack under the existing rule of LGU.

3.9 Project Cost

The unit costs/prices are determined considering the recent projects executed by the line agencies and NGOs in June 2000. Exchange rate based on the average rate for three months from March to May 2000 is applied for this estimate.

1.0 US$ = 42.0 pesos = 106.0 yen
For cost estimate, the following assumptions are applied:

Administration Cost:	8 % of direct construction cost
Physical Contingency:	10 % of costs such as direct construction cost, administration cost

For estimate of price contingency, the annual price escalation rate of 2.0 % for the foreign currency portion is used based on the average rate for advanced five (5) countries. The annual price escalation rate of 9.4 % for the local currency portion used is based on the average rate for one (1) year from July 1998 to June 1999.

The total project cost amounted to 298 million pesos. The necessary project costs by short, medium and long term development period are 183 million, 49 million and 66 million pesos, respectively. (refer to Table 3-9-1)

The operation and maintenance costs consist of fuel costs and electricity of facilities, repair cost of the offices and labor cost, O&M and general management costs. For physical contingency, the assumption applied is 10 %. The necessary operation and maintenance costs by short, medium and long term development period are 270 thousand, 1,400 thousand and 3,160 thousand pesos, respectively. (refer to Table 3-9-2)

Table 3-9-1 Project Cost

unit : '000 pesos

Development Plan	Quantities	Short Term			Medium Term			Long Term			Total		
		LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Agriculture Development Plan		158	0	158	7	0	7	0	0	0	165	0	165
1.1 RTV Disease Training	1 L.S	4	0	4	0	0	0	0	0	0	4	0	4
1.2 Hybrid Rice and Mungbean introducti	1 L.S	10	0	10	0	0	0	0	0	0	10	0	10
1.3 Community plant nursery	1 L.S	129	0	129	5	0	5	0	0	0	134	0	134
1.4 Crop diversification (perennials)	1 L.S	2	0	2	2	0	2	0	0	0	4	0	4
1.5 Food processing	1 L.S	13	0	13	0	0	0	0	0	0	13	0	13
2. Irrigation Development Plan													
2.1 Padapad CIP	45 ha	0	0	0	0	0	0	1,830	7,076	8,906	1,830	7,076	8,906
3. Post-Harvest Development Plan		5,297	3,658	8,955	10,594	7,315	17,909	5,622	3,460	9,082	21,513	14,433	35,946
3.1 Solar Dryer by Barangay (1)	12,233 sq.m	5,297	3,658	8,955	0	0	0	0	0	0	5,297	3,658	8,955
3.2 Solar Dryer by Barangay (2)	24,466 sq.m	0	0	0	10,594	7,315	17,909	0	0	0	10,594	7,315	17,909
3.3 Solar Dryer by Cooperative	10,800 sq.m	0	0	0	0	0	0	4,676	3,230	7,906	4,676	3,230	7,906
3.4 Mechanical Dryer	130 sq.m	0	0	0	0	0	0	562	62	624	562	62	624
3.5 Warehouse	240 cavan	0	0	0	0	0	0	384	168	552	384	168	552
4. Farm-to-Market Road Development Plan		511	487	998	803	765	1,568	584	557	1,141	1,898	1,809	3,707
4.1 Aggasaid to ISF Rd	3.5 km	511	487	998	0	0	0	0	0	0	511	487	998
4.2 Sabado to Rainfed area	2.0 km	0	0	0	292	278	570	0	0	0	292	278	570
4.3 Minagbag to Magamot CIP	3.5 km	0	0	0	511	487	998	0	0	0	511	487	998
4.4 Avecilla along LAT Extra Rd to NIA ca	1.0 km	0	0	0	0	0	0	146	139	285	146	139	285
4.5 Valdez Rd	1.5 km	0	0	0	0	0	0	219	209	428	219	209	428
4.6 Leal Rd.	1.5 km	0	0	0	0	0	0	219	209	428	219	209	428
5. Farmers' Organization Development Plan	1 L.S	629	167	796	122	3	125	0	0	0	751	170	921
6. Rural Credit Plan	1 L.S	0	0	0	885	707	1,592	1,884	1,012	2,896	2,769	1,719	4,488
7. Livelihood Development Plan		203	0	203	0	0	0	0	0	0	203	0	203
5.1 Livestock & poultry development	1 L.S	164	0	164	0	0	0	0	0	0	164	0	164
5.2 Backyard gardening	1 L.S	7	0	7	0	0	0	0	0	0	7	0	7
5.3 Fish culture	1 L.S	28	0	28	0	0	0	0	0	0	28	0	28
5.4 Mushroom culture	1 L.S	4	0	4	0	0	0	0	0	0	4	0	4
8. Management Capability Building Plan	1 L.S	162	396	558	10	40	50	0	0	0	172	436	608
9. Operation and Maintenance Equipment	1 L.S	10,014	78,961	88,975	0	0	0	0	0	0	10,014	78,961	88,975
10. Consultant Service Fee	1 L.S	10,071	23,947	34,018	887	2,922	3,809	92	353	445	11,050	27,222	38,272
Sub-Total		27,045	107,616	134,661	13,308	11,752	25,060	10,012	12,458	22,470	50,365	131,826	182,191
Administration Cost (8%)		2,164	8,609	10,773	1,064	941	2,005	802	996	1,798	4,030	10,546	14,576
Sub-Total		29,209	116,225	145,434	14,372	12,693	27,065	10,814	13,454	24,268	54,395	142,372	196,767
Physical Contingencies (10%)		2,920	11,624	14,544	1,438	1,269	2,707	1,083	1,345	2,428	5,441	14,238	19,679
Sub-Total		32,129	127,849	159,978	15,810	13,962	29,772	11,897	14,799	26,696	59,836	156,610	216,446
Price Escalation		12,466	10,467	22,933	16,686	2,228	18,914	34,347	4,865	39,212	63,499	17,560	81,059
TOTAL		44,595	138,316	182,911	32,496	16,190	48,686	46,244	19,664	65,908	123,335	174,170	297,505

Table 3-9-2 Operation and Maintenance Costs

unit : '000 pesos

Development Plan	Short Term			Medium Term			Long Term			Total		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Irrigation Development Plan	203	0	203	775	0	775	1,550	0	1,550	2,528	0	2,528
2. Farmers' Organization Development Plan	15	0	15	3	0	3	0	0	0	18	0	18
3. Rural Credit Plan	0	0	0	319	0	319	638	0	638	957	0	957
4.Others	30	0	30	179	0	179	686	0	686	895	0	895
Sub-Total	248	0	248	1,276	0	1,276	2,874	0	2,874	4,398	0	4,398
Physical Contingencies (10%)	24	0	24	128	0	128	290	0	290	442	0	442
TOTAL	272	0	272	1,404	0	1,404	3,164	0	3,164	4,840	0	4,840

3.10 Project Evaluation

3.10.1 Farm Budget Analysis

Similarly to the farmers at the Quiling and Lapogan ARC, those at the Minagbag ARC earn the majority of their income from the production of paddy and corn in both wet and dry seasons. The farm budget analysis of these major crops at Minagbag is shown in Tables J-63A to J-66A in Appendix J. Other minor crops produced at the Minagbag ARC are mungbean, fruits (banana, mango and calamansi. Livestock and fished raised at Minagbag are hog fattening, backyard poultry raising, and Tilapia culture. The farm budget analysis of all these minor crops as well as backyard livestock raising are shown in Tables J-4A to J-29A in Appendix J.

The net production values (NPV) of most annual crops (rice, corn, beans, vegetable) produced at Minagbag are also positive. Except banana, other fruits with high investment in the first (1st) year and zero earning in the following four (4) to six (6) years give negative NPV for all the no-production years and positive later on. The NPVs of pig, poultry and Tilapia production, which require high investment in the first (1st) year, also give negative NPV in the first (1st) year and positive NPV later on.

3.10.2 Project Evaluation

(1) Financial Analysis

Likewise those of the Quiling and Lapogan ARCs, the financial analysis of the Minagbag ARC is based on the same set of assumptions illustrated earlier. The financial analysis of the Minagbag ARC indicates a medium FIRR of 24 % for the Low case and higher than 50 % for the High case. Their Net Present Worth at 15 % opportunity cost of capital are 25.11 and 74.20 million pesos respectively.

The sensitivity tests of the low-case FIRR indicate a 13 % resistance to reduced benefit 31% resistance to increased production cost; and 29 % resistance to increased project costs. Those of the High case are 30 % decrease in production benefit; and more than 50 % for both the increased production and project costs.

(2) Economic Evaluation

Economically, there are two ways of deriving the Economic Internal Rate of Return (EIRR) of a project. One is to apply the Standard Conversion Factors (SCF) to the financial

prices of all inputs and outputs used in the analysis. The other is through applying the Shadow Exchange Rate (SER). Algebraically, the relation between the SCF, SER, the Official Exchange Rate (OER) and the Foreign Exchange Premium (FX) are as follows:

SER = OER x (1 + FX premium) = OER/SCF
SCF = 1/(1 + FX premium) = OER/SER

While SCFs are generally used for an internationally financed project, the requirement of the NEDA/ICC is that the SERs be used in deriving the EIRR to any project submitted for its consideration. The suggested values of the two are currently given by NEDA are given below;

Variables	International Standard	NEDA/ICC
1. Foreign exchange rate	OER	Shadow exchange rate
2. Conversion factors	SCF	SER
3. Tradable items	SCF = 1.0	SER= 1.2
4. Non-tradable items	SCF = 0.8	SER= 1.0
5. Unskilled labor	SCF = 0.6	SER= 0.6

The two (2) major food grains in the Minagbag ARC, namely, rice and corn, are regarded as tradable items in the economic analysis of this report.

Apart from the EIRR calculated on the basis of the SER, another sets of EIRR calculated based on the SCF are as follows. In general, the EIRRs derived from the two factors are very close. Possible deviations from each other are due to the different proportion of the tradable and non-tradable inputs applied and output produced. (refer to Table J-78C in Appendix J)

Results of EIRR Calculation (%)

Case	Minagbag ARC	
	w/ SER	w/ SCF
Low	6	19
High	15	27

3.10.3 Financial Viability of Implementing Agencies

The financial viability of the Quezon Municipality, where the Minagbag ARC is, in terms of its Net Loanable Allowance (NLA) is shown in Table J-77A in Appendix J. It is higher than the proposed project development costs in almost every year, except in the fourth

(4th) and fifth (5th) years of the project when the proposed project costs are 53.03 and 45.59 million pesos against the NLA of 27.88 and 32.01 million pesos, respectively. This will call for the adjustment of the project cost to at least lower than the respective NLA.

3.10.4 Initial Environmental Examination (IEE)

The proposed ARC development plan consists of the agriculture development, irrigation development, post-harvest development, farm-to-market road development, farmers' organization development, rural credit, and livelihood development plans and management capability building. The environmental checklist covers the development plans. (refer to Table 3-10-1)

These development plans will not have serious impact on the present environment condition, because the development plans proposed are small in scale. Consequently, Environmental Impact Assessment (EIA) is not necessary. The impacts of the proposed ARC development plans are presented as follows:

(On Socio-Economic Environment)

- Income gap is observed between developed and undeveloped ARCs. However, the proposed development plans when implemented will reduce the gap.
- Existing system/custom and social structures will gradually be changed by the farmer's organization development plan. However, since the development plan will only strengthen the existing multi purpose cooperatives, the impact may not be extensive.

If the existing farming practices will continue, it will have a negative impact on the existing environment. The following environmental conservation measure will be considered in the implementation of the proposed development plans:

- Extension of Integrated Pest Management (IPM) to decrease utilization of chemicals and pesticides.

Table 3-10-1 Environmental Checklist

Environmental Issues \ Activities of Construction	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organaization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
I. Socio-economic Environment													
1. Social Life													
(1) Living													
- Planned resettlement													
- Non-spontaneous resettlement		C	C	C	C	C	C	C	C				
- Change in life style	C	C	C	C	C	C	C	C	C	C	C	C	
- Friction among inhabitants	C	C	C	C	C	C	C	C	C	C	C	C	
- Indigenous people / Minority / Nomad													
(2) Population													
- Population increase													
- Sudden change in population composition													
(3) Economic activities													
- Shift of economic activity base	C	C	C	C	C	C	C	C	C	C	C	C	
- Shift in / economic activities unemployment	C	C	C	C	C	C	C	C	C	C	C	C	
- Expansion of economic gap	B	C	C	C	C	C	C	C	C	B	B	B	
(4) Institution / Custom													
- Resettlement of water right / fishery right		B	B									C	
- Change in social structure (e.g. organization)	C	C	C	C	C	C	C	C	C	B		C	
- Restructuring of existing system / custom	C	C	C	C	C	C	C	C	C	B		C	
2. Health / Sanitation													
- Increase in pesticide use	C											C	
- Outbreak of endemic disease	C	C	C	C	C	C	C	C	C			C	
- Spread of infectious illness	C	C	C	C	C	C	C	C	C			C	
- Accumulation of residual toxic (e.g. pesticides)													
- Increase in waste / excrement													
3. Historic spot / Cultural heritage / Scenery													
- Damage and destruction of historic spot / cultural heritage		C	C	C	C	C	C	C	C				
- Loss in important landscape or scenery	C	C	C	C	C	C	C	C	C			C	
- Impact to buried cultural assets		C	C	C	C	C	C	C	C				

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

: not applicable

(Continue)

Table 3-10-1 (Continued)

Activities of Construction / Environmental Items	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organaization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
II. Natural Environment													
4. Valuable life / ecological area													
- Change in vegetation	C	C	C	C	C	C	C	C	C			C	
- Impact to scarce or specific animal or plant species													
- Diversity of species	C	C	C	C	C	C	C	C	C			C	
- Penetration / Propagation of a harmful life	C	C	C				C	C	C			C	
- Extinction of wetland / peat bog													
- Extinction of tropical forest / wild land													
- Destruction of mangrove forest													
- Destruction of coral reef													
5. Soil / Land													
(1) Soil													
- Soil erosion	C											C	
- Salinization of soil	C											C	
- Fall in soil fertility	C											C	
- Soil contamination	C	C	C				C	C	C			C	
(2) Land													
- Land degradation (including desertification)	C	C	C				C	C	C			C	
- Hinterland degradation	C	C	C				C	C	C			C	
- Land subsidence	C	C	C	C	C	C	C	C	C			C	
6. Hydrology / Water quality													
(1) Hydrology													
- Change in surface runoff	C	C	C	C	C	C	C	C	C			C	
- Change in groundwater runoff / level	C	C	C	C	C	C	C	C	C			C	
- Inundation / Flood	C	C	C	C			C	C	C			C	
- Soil deposit	C	C	C				C	C	C			C	
- Fall in riverbed													
- Shipping													
(2) Water quality / Water temperature													
- Water pollution / degradation	C	C	C	C	C	C	C	C	C			C	
- Eutrophication	C	C	C	C	C	C	C	C	C			C	
- Change in salt-water													
- Change in water temperature	C	C	C	C	C	C	C	C	C			C	
(3) The air													
- Air pollution	C	C	C	C	C	C	C	C	C			C	

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

////: not applicable

Chapter4

San Manuel ARC

Chapter 4 San Manuel ARC

4.1 Category of the ARC

Based on the ARC classification and clustering, San Manuel ARC is categorized as follows:

Area	Geographic Condition	Possibility of Irrigation Development	Current Irrigation Facilities	LTI (%)	Strategic Vitality of Farmers Organizations: Current Condition and Motion
Developing Area	Mixture of flat and hilly	No	—	82	High vitality and moving upward

4.2 Present Condition and Problem

4.2.1 Agriculture

(1) Present Condition

The ARC is located at the undulating gentle slope as a whole. The farmland is 749 ha, corn is planted at 400 ha at the slope portion and rice is grown at 300 ha at the bottom of the valley or along creeks, where is partly irrigated with pumps. Soils are clayey loam. Hard latelite is exposed with no topsoil at the periphery of the ARC where the land is abandoned and it seems that it does not fit to farming. Natural gas is under test pitting by the Philippine National Oil Company (PNOC) near the ARC.

Corn is grown twice a year, one from May to October and another from November to March. Its yield is very low, merely 42 cavan/ha in both seasons. Hence, no much profit was obtained from the low yield. In the ARC, there are many farmers losing in corn growing if the production cost is calculated in details, however, farmers do not usually compute. The total corn production in the ARC is 33,600 cavans (1,680 MT) a year. Rice is grown once under rainfed condition from May to October, yielding only 27 cavan/ha, and twice with pump irrigation from May to September and from November to March, yielding 45 cavan/ha. Both yields are very low. Total production of palay in the ARC is 22,590 cavans (1,130 MT) in a year. Vegetables and fruit trees are grown at the backyard, and animals are kept in a small scale at the homestead, as well. Tilapia is raised at the ponds, which was provided under the

Small Farmer Reservoirs (SFR) Program. Main farm produces in this ARC are as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Total (cavan)	Total (MT)
Rice	300	230	45,27	45	12,240	10,350	22,590	1,130
Corn	400	400	42	42	16,800	16,800	33,600	1,680

(2) Problems

The productivity of both palay and corn is very low, and especially for corn, it brings a negative profit from growing. Poor roads in the farmland and conventional farming (lack of technology) cause production cost high. Soils in the cornfield are eroded because farmers grow corn at the slope in the same manner as at the flat land. Drying facilities are insufficient and farmers are often obliged to sell wet grains at cheaper price. Most of the farmers have loans from private traders for their farm inputs.

4.2.2 Agriculture and Rural Infrastructures

(1) Present Conditions

a) Irrigation

San Manuel ARC has a high altitude that it becomes difficult to get irrigation water from MRIIS. Furthermore, it is far from the main canal. Near the border of the ARC, there are some creeks for possible water source as Likiad Creek and others. In the rainy season irrigation water is provided with more than ten (10) units of small pumps. However, during the dry season only few pumps are operational due to limited water resource. In the small acreage of farmlands at the bottom of the valleys, water is supplied using pumps taken from the ponds.

b) Post Harvest Facility

The table below shows the post harvest facilities in the ARC.

Items	No. of places	size	area
multi-purpose drying yard	1	25 m x 18 m	420 sq.m
multi-purpose paving yard	1	50 m x 4 m	200 sq.m

There is neither a warehouse nor a mechanical dryer in San Manuel ARC.

c) Farm Road

From the municipality to the center of San Manuel ARC, the distance is about 20 km by way of the Maharlika national road leading to the Province of Quirino toward the south of the Province of Isabela. The roads in the ARC are as follows.

Village Road	6.0 km	width 3-5 m	almost gravel road
Farm Road	4.0 km	width 1-3 m	almost unpaved

The right of way for the farm roads has been secured, but the existing farm roads are not passable in the rainy season, because the ground levels of these roads are low that becomes muddy easily. Only sledge pulled by cows can pass through the farm roads in the rainy season.

(2) Problems

The growth of the crop depends almost on rainwater. The crop yield is lower due to rainfed condition. There is no water source for irrigation in the ARC.

The shortage of the drying facilities has compelled the farmers to transport the crop to the concrete paved national road or sell the crop without drying. This reduces the income by about 2.0 peso/kg when they sell the crops without less drying. When farmers transport the crops to the national road by labor, they have to pay about 0.5 peso/kg.

Entry to the ARC during the rainy season is difficult. Therefore, the palay in the rainy season may at not be timely harvested due to the difficulty of bringing the thresher to the farm. If palay does not harvest within the desirable period of one week, the quality of palay deteriorates and sale price comes lower. Even when the threshers are carried into the farmland at high expenses, transportation of the product has to depend on lots of labor through the long, muddy and soft paddy field. The shortage of passable and good farm road has therefore contributed to the high cost of production of crops.

4.2.3 Farmers Organization

San Manuel MPCI was established in 1990. Due to lack of leadership of MPCI officials, the remarkable activity was not undertaken for a while. It was not until 1997 when the new BODs were elected, that the MPCI reinforced organizational vitality. There were 140 members who joined the MPCI at present. The collection of share capital is carried out smoothly, although the present CBU amounted to 1.0 cavan/ha is rather high compared with other MPCIs. Since 1998, social preparation has been conducted by BIDANI.

The MPCI has a loan from two (2) government institutions amounting to 2.7

millions pesos totally.

① LBP loan provided in 1994 was once restructured and payable amount at present is 900,000 pesos. This loan was re-loaned to 72 farm households equally at 12,000 pesos. According to MPCI, 60 % of borrowers are paying on due dates, 35 % are paying partly, and five (5) % are delinquents, without intention to pay. Until now, only 15 % of the total borrowed amount was paid.

② The MPCI has obtained CAP-PBD-DAR co-financed loan amounted to 1.7 million pesos, which was used to buy a 4-wheeler tractor. The MPCI owns this tractor at present and is paying 200,000 pesos quarterly. MPCI is lending this tractor to the members at 1,000 pesos/day, and out of which 900 pesos are placed to loan payment. The remaining 100 pesos are added to CBU for the borrower.

At present, MPCI owns 450,000 pesos of CBU. The MPCI is planning to apply a new loan payment system called "Tutok Sako" system[1], but they have not generated yet the idea for the incentives of the executors of this scheme.

The MPCI has been recovering vitality since the election of new officials in 1997. The reasons are explained as follows:

① Introduction of new rules

They have translated the policies in Ilocano and simultaneously produced the new rules, which include the guidelines on lending tractor and policies on tractor operator. For thorough implementation of rules, they have increased the frequency of general assembly meeting to quarterly basis.

② Harmonize MPCI business with Barangay Development Council (BDC)

The MPCI discusses BDC without organizational boarder and BDC headed by Barangay captain advises to MPCI. However, they have regulated that official of MPCI cannot be appointed official of BCD, and vice-versa. In other words, each officer cannot be an officer of both organizations. Thus, the rule avoids the concentration of the political power and forms the system to foster MPCI. This seems to be the reason for high "Organizational Vitality[2]" in DCC.

③ Leadership

All coop officials have rather high educational background. Similar to some other MPCIs, the coop manager is involved in the management to a great extent and the president is playing the role of listening to opinion of other members. In case of MPCI, the leadership of the manager and treasurer seems to be strong and forming a driving force to members' activities. Further, the MPCI is setting a common target, that is Sadri MPCI in Luna Municipality as ideal one. These

[1] In the "Tutok Sako system", MPCI acquires a portion of harvest at the rate before the produces sold to traders. The system is similar to Lapogan MPCI.

[2] Refer to "4.3 Diagnosis of Organizational Culture" in the succeeding pages.

factors seem to increase "Strategic Vitality[3]" in DCC.

At present, CBU collection as well as loan payment are being done smoothly, but are sometimes delayed due to the damage brought about by drought and typhoons.

(2) Problem

a) Lack of provider in advance technology

The MPCI has the culture to introduce advance technology aggressively, however there are no enough providers in the Study Area, especially the following fields are necessary.

i) Training for MPCI's management in advance agricultural techniques such as cultivation of hybrid rice, soil and fertilizer control.
ii) Training for MPCI officials in accounting, auditing, and personnel administration system.
iii) Training for MPCI members in credit management

b) Improvement of by-laws and policies

The fundamental rules are already consolidated and managed well, however, the implementing body, its incentives and penalty are not clearly defined yet.

i) Operation rule in Tutok Sako System
ii) Incentives and penalty to MPCI officials and CBU collectors

c) Lack of pop up project

The project to accelerate the coop's further growth is not formulated yet. Also, the MPCI does not have the capability to find a project, which accrue bigger benefit by expanding the territory.

4.2.4 Rural Economy

(1) Present Situation

The San Manuel ARC is composed solely of residents of the San Manuel Barangay, which has a total population of 1,164 in 235 households (12 % of which are ARB households). Land ownership averages 3.2 ha per household. Almost all agricultural produces are sold to

[3] - ditto -

traders. The prices per kilogram are as follows.

Product	Wet season	Dry season
Palay	8.5 pesos/kg (to private traders)	8.5 pesos/kg (to private traders)
Corn	4.5 pesos/kg (to private traders)	4.5 pesos/kg (to private traders)

Palay and corn production costs per ha are estimated at 14,615 and 12,165 pesos, respectively. Fertilizer occupies the largest share of the farm inputs; it accounts for 46 % of the total in the case of corn. Due to the underdeveloped state of production roads, the transportation cost comes to about 15 pesos/cavan of harvest. However, this is a localized problem that affects only some of the farms.

The typical farm employed in the farm budget analysis owned 3.2 ha of land, consisting of 1.4 ha of rainfed rice and 1.8 ha of cornfield. The farm budget analysis estimated farm income at 43,500 pesos, non-farm income at 5,500 pesos, and off-farm income at 500 pesos, for a total annual income of 49,500 pesos. Based on information obtained from interviews, it is thought that the typical farm borrows about 8,000 pesos (equivalent to about 40 % of the production cost per crop) per cropping from private lenders, and applies almost all of it to purchase of farm inputs. Interview responses indicated that the typical farm family is worried about repayment in the event of borrowing amounts of more than 13,000 pesos, which is equivalent to about 30 % of the annual farm income of 43,500 pesos. However, some farms are actually borrowing more than this, and the household economy on farms is generally on very frail footing.

(2) Problems

The typical farm derives about 87 % of its total income from farming. The figures suggest that income from other sources is fairly large, but reflect the low level of farming productivity. In fact, off-farm income and non-farm income taken together average about 6,000 pesos, or about the same as in other ARCs.

4.2.5 Problems of the Supporting Systems and Operations

The BARC was established in 1993 and the BARC officers met only when there was a land dispute. The last meeting of the BARC was conducted in 1998. The BARC is an independent organization from the Barangay officials.

The BDP was prepared in 1995 initially by the Barangay officials with the officials of the MPCI, the BARC and women's association. The Municipal Planning and Development Officer (MPDO) and DF assisted them. The ARCDP was prepared in 1992

initially by the Barangay officials, the MPCI officials and the DF. The Barangay officials took no follow-up activities after the planning of the ARCDP.

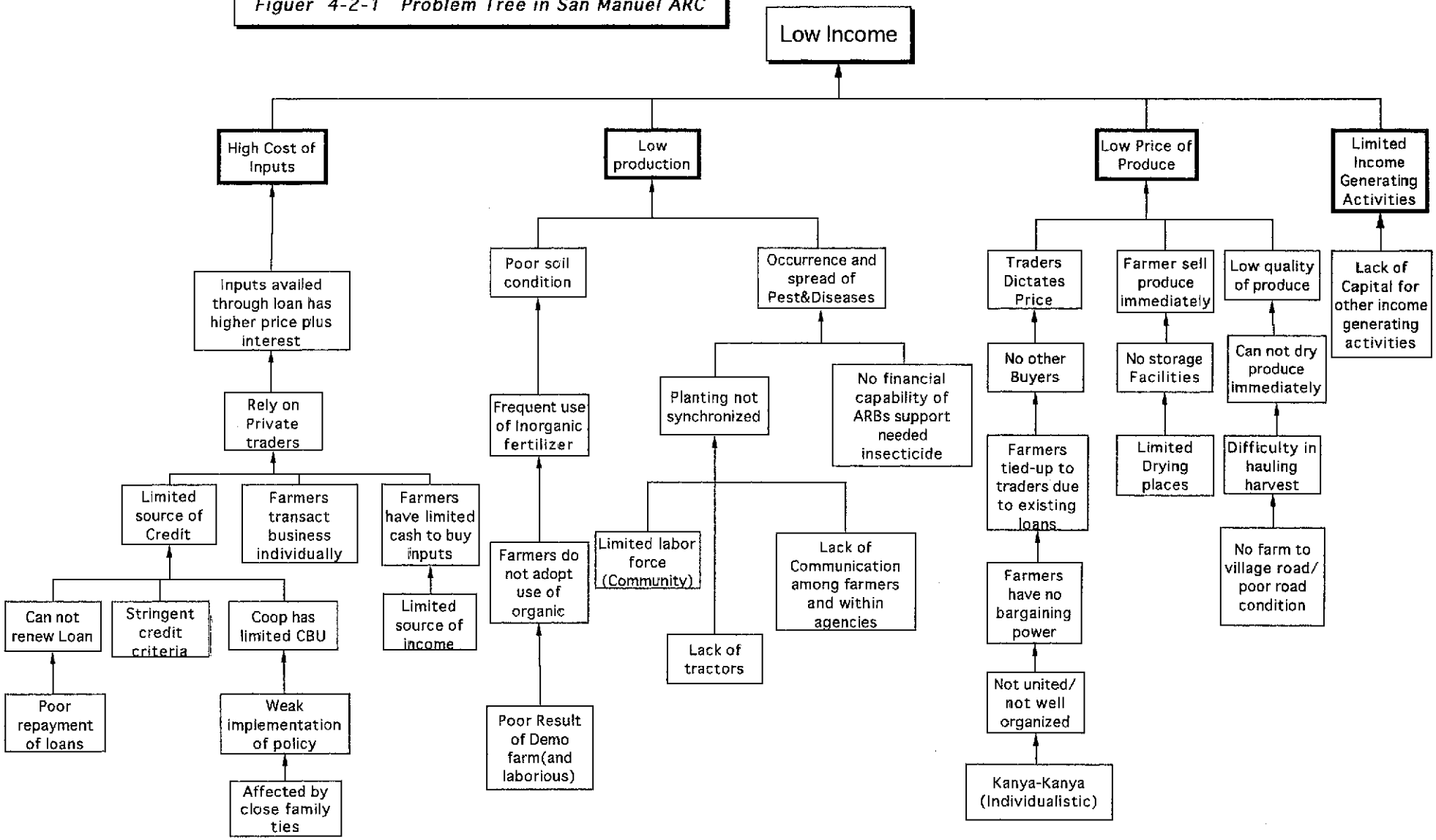
Besides DF, the agency representatives visited the Barangay, were only a few; a) the DA-LGU officer(s) who visited to conduct farming skills training and distribute agriculture inputs, b) the NIA officer(s) who visited at the harvest time to collect irrigation fees, and c) the municipal officer(s) who visited when infrastructure projects were implemented.

At the municipal level, the MCIT was organized in 1993, and since then only two (2) meetings were held until today.

4.2.6 Results of Workshop

The problem tree prepared through the workshop with the Barangay people is shown in Figure 4-2-1. The direct causes of low income identified are; a) High cost of inputs, b) low production, c) low price of the farm products, and d) limited income-generating activities.

Figuer 4-2-1 Problem Tree in San Manuel ARC



4.3 Diagnosis of Organizational Culture

(1) Positioning in Context of Cooperatives in the Study Area

a) Historical development

The Barangay was founded in the late 1930s, when Ilocano people moved into the land that had originally been inhabited by Yogat (a mountain people who were found in the zone from Tarlac to northern Luzon and lived mainly by hunting and logging). Even today, there is a separation between the two ethnic groups in the Barangay (the Yogat reside only in Purok 3). Yogat residents have a strong attachment to the land and home of their ancestors, and still adhere to a way of life attaching the greatest value to the family interests. Although their native language is different from that of the Ilocano, they generally know how to speak Ilocano. The Barangay has a population of 1,200 in 230 households, consisting of 190 Ilocano households and 40 Yogat households. (This is obviously the reason for the domination of the Ilocano language.) The fact is that the original ethnic groups tend to have more poverty and to participate less in the community than the Ilocano people[1]. Since the early 1980s, the Barangay has been operating an irrigation pond for culture of Tilapia, for provision to the residents at a low price. This project is thought to be the first to generate common property bringing the Ilocano and Yogat together. In 1998, BIDANI organized a livelihood project for improvement of the standard of living through sewing work (i.e., dressmaking).

b) Static analysis

The DCC survey found that the San Manuel MPCI fell in the “Vibrant” domain. There is a high awareness of the cooperative business, and also an atmosphere of free and easy communication among the members. As such, the culture is favorable to internal exchange of views.

The following can be cited as reasons for the positioning in the "Vibrant" domain because of the high degree of “Organizational Vitality”.

i) Cooperation with the Barangay development committee

There is a complementary relationship with the Barangay development council (BDC) headed by the Barangay captain. The representatives of the

[1] It should also be noted that the policy of interethnic harmony is gradually making progress, and that the Barangay council now contains two Yogat members.

two organizations routinely meet for discussion. In addition, the two have made arrangements for cooperation and mutual notification in decision making.

ii) Prevention of a concentration of power

The current Barangay captain engages in an extensive collection of views from residents. He is also actively supporting the cooperative, but leaves it free to make its own decisions as a matter of policy. Although there is no explicit statement on the subject in writing, there is, in effect, a principle that the head of one organization must not also be an executive in the other.

iii) Strategy of the manager

The president of the cooperative essentially functions as a figurehead; the operation of the cooperative is actually directed by the BOD meetings, which are led by the manager. The manager is a university graduate, and is highly skilled in the drafting and deployment of business strategy due to his past experience of work at a corporation. It is easy for members to voice opinions because the organization is not geared for being driven by the leadership of an individual, and this is increasing the "Organizational Vitality".

iv) Standards and guidelines

The cooperative basically has rules and policies to serve as standards, except in the area of relending, where some are now being formulated[2]. The 4WD tractor purchased with funds from the CAP-PBD-DAR program is the common property of the cooperative members, and there are detailed rules about its operation and use.

The San Manuel MPCI has a well-balanced distribution as regards vitality; the BOD belongs in the "Vibrant" domain, the head in the "Kintaro" domain, and the officials in the "Anarchy" domain. More specifically, the officials raise all sorts of ideas of their own free conception ("Anarchy"), the president attempts to control the outpouring ("Kintaro"), and the BOD ultimately coordinates things while showing respect for debate ("Vibrant"). This is the same kind of style that is found in excellent companies. Similarly, the leadership analysis revealed that, whereas the BOD thought the coop president was lacking somewhat in respect of leadership, both the officials and the members gave extremely high ratings to the BODs. These findings evidence the extent of trust placed in the BODs.

c) Dynamic analysis

As of July 2000, the dynamic analysis (movement survey) concluded that the organization had an upward orientation ("Upturn" domain). The Barangay provides occasions for free exchange of opinions by the residents, with the

[2] However, there are certain problems: 1) the documents are the property of the officials, and members are not given free access to them, and 2) incentives and penalties have not been incorporated.

Barangay captains having the final say in decisions. The orientation was judged to be “Uptuen” in light of the following factors as well.

i) The number of cooperative members attending the hearings and workshops, and their active voicing of views in them

ii) Strictness as regards time in dealing with the requests of DARPO and the Consultants

iii) The logical explanations of the officials and the strong support of them by the Barangay captain

(2) Evolution from "Vibrant" to "Area-wide Cooperative"

Although the cooperative is saddled with debt, it also has strengths such as a steady increase in the CBU total, initiative with strong leadership, and followers who support the leader. Organizationally, it is consequently thought to have a fairly high degree of vitality. Its debt should be cleared eventually if the current direction is maintained.

The phased development required by the cooperative consists of the following: 1) review of the existing internal rules, 2) technical training, and 3) implementation of a project for substantial advancement once there are clear prospects for complete repayment of debt.

The review of internal rules would be aimed primarily at the formulation of explicit provisions for operation of the Tutok Sako system. This system is currently[3] being studied in connection with the draft guidelines for relending and incentives for their enforcement, the incorporation of these provisions as rules, and directly access to the document by the members. It is proposed that the implementation of the review through a process of three (3) steps; 1) preparation of a draft in a workshop with cooperative officials, with the advice of experts; 2) approval of the draft at a meeting of the whole cooperative; and 3) copying of the document with the DAR’s assistance for distribution to all members. The entire process should be urgently implemented.

As for training, there is a deep need for training in the cultivation of hybrid rice and management of soil and agricultural chemicals. In addition, cooperative officials are thought to require training in auditing, accounting, and personnel management, and members, with PMS training in moral obligations. The technical training should

[3] Properly speaking, such studies were being made in July 2000.

probably be furnished by experts dispatched by DARPO[4], and the training in cooperative management, through commissions to the LBP, CAVALCO, and DAR. Given the cooperative's high degree of vitality, immediate implementation of the training could be expected to have substantial effect.

The project for a dramatic leap forward should be implemented once the complete repayment of the debt, which now stands at about 2.4 million pesos, is in sight. As such, it should enter planning about one (1) year before the fiscal year in which the debt is scheduled to be paid off. Current projections place complete repayment in fiscal 2003. The specific proposal for the project is the construction of a warehouse for storage of the CBU payment in kind (rice and corn) to the cooperative, and start of trading business based on sales from the store to traders. DARPO experts should be involved to offer advice in sales know-how[5].

[4] The business consultant proposed in the master plan could play this role.
[5] (Same as the footer above)

4.4 Agriculture Development Scheme

4.4.1 Agriculture Development Plan

Corn is grown mainly at the slope areas in the ARC. Many farmers do not gain much from corn production. In order to increase corn yield, season long training on IPM and INM shall be conducted by RCPC and extension workers at the early stage of the project.

It is planned in the ARC to convert 100 ha, 20 % of the cornfield into fruit trees in order to increase profit from farming. A community plant nursery is required to raise necessary seedlings. The plant nursery will be set up on a 0.5 ha after social preparation activities is finished in the ARC. The nursery will be established with technical support from CVIARC and PENRO. The advice and training on plant propagation shall be continued for five (5) years. The nursery will be operated and managed by Barangay Council and the seedlings shall be sold to farmers at reasonable price for the maintaining the nursery. Extension workers will guide planting of trees after the third year when the seedlings are ready for planting. Sloping agriculture should be instructed by Bureau of Soil & Water Management Office (BSWMO) and extension workers to protect soil from erosion. The technology will be disseminated together with crop diversification. Farm production at the end of the Long Term Development stage is planned as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Yield (MT/ha)	Total (cavan)	Total (MT)
Rice	300	230	88	100	26,400	23,000	-	49,400	2,470
Corn	300	300	80	80	24,000	24,000	-	48,000	2,400
Banana	40	-	-	-	-	-	f 120	-	f 4,800
Pineapple	10	-	-	-	-	-	40.3	-	403
Mango	5	-	-	-	-	-	7.5	-	37.5
Avocado	5	-	-	-	-	-	10.2	-	51
Santol	5	-	-	-	-	-	8.5	-	42.5
Calamansi	5	-	-	-	-	-	18	-	90
Gmelina	30	-	-	-	-	-	-	-	-

Note: f - stands for finger (‘000)

4.4.2 Post Harvest Facility Development Plan

(1) Objectives

The post harvest facilities aim to improve the quality of grains and increasing the farmers’ income through timely sale of the farm outputs at advantageous price. The proposed facilities are multi purposes solar dryers and a warehouse with a solar dryer and a mechanical

dryer.

(2) Facilities Plan

The facility will have the capacity to dry a part of crop produces in the ARC area. The amount of produce to be stored shall be 20 % (10,080 cavan) of the total planned produce. The proposed floor area of the warehouse will be 240 sq.m. Grains to be stored in the warehouse will be dried at the attached solar dryer for long storage. About 75 % of the stored amount (15 % of the total production) will be dried at the solar dryers. The mechanical dryer will dry the remaining volume, and its capacity is 30 cavan/day.

The proposed plan of the drying facilities is shown as follows. (refer to Appendix F)

In charge	Drying Method	Ratio (%)	Planned Drying Amount (cavan)		Area (sq.m)
			rice	corn	
Private	garden	15	3,960	3,600	5,610
Barangay	multi-purpose solar dryer	65	17,600	15,600	24,311
Cooperative	solar dryer	15	3,960	3,600	5,610
	mechanical dryer	5	1,320	1,200	-
Total		100	26,400	24,000	35,531

(3) Implementation Schedule

In consideration of the progress of capability building of the LGUs and MPCI, the drying facilities will be introduced under the following schedule.

Solar Dryer in the private gardens:

Considering the progress of activities of the capability building of cooperatives and Barangay officers, for solar dryers in the private gardens, no specific schedule has been made since this belongs to private property. The construction of the drying facilities will be completed within the period of the short or middle term development stages.

Solar Dryers managed by Barangay:

The post harvest facilities that will be managed and maintained by the Barangay will start in the second (2^{nd}) year of the short term development stage and be completed during the short/middle term development stage. This schedule will commence after the improvement of capability of the Barangay officials, the progress of the ratio of irrigation area and the agriculture development. The solar dryers and multi-purpose pavement included both in the Barangay Development Plan are to be constructed at a comparatively earlier stage in the short term development stage.

Warehouse (including solar dryers and a mechanical dryer)

The facility shall be managed and operated by MPCI. The construction of the

facility shall commenced after MPCI has accumulated a CBU of over 200,000 peso, an indication of progressive activity f the cooperative. Therefore, the component will be carried out during the middle term development stage.

4.4.3 Farm to Market Road (FTMR) Development Plan

(1) Objectives

The proposed farm roads aim to improve timely harvesting, the quality and increase in the farmer's income through the reduction of the extra cost for the transportation. This project has to be introduced after the improvement of capability of Barangay has been achieved.

(2) Road Plan

Applying the criteria of 10 m/ha at 6.1.4 in Chapter 1 of this report, the following roads are planned at the locations prepared for the purpose. The proposed length of each road is as shown follows. (refer to the attached drawing)

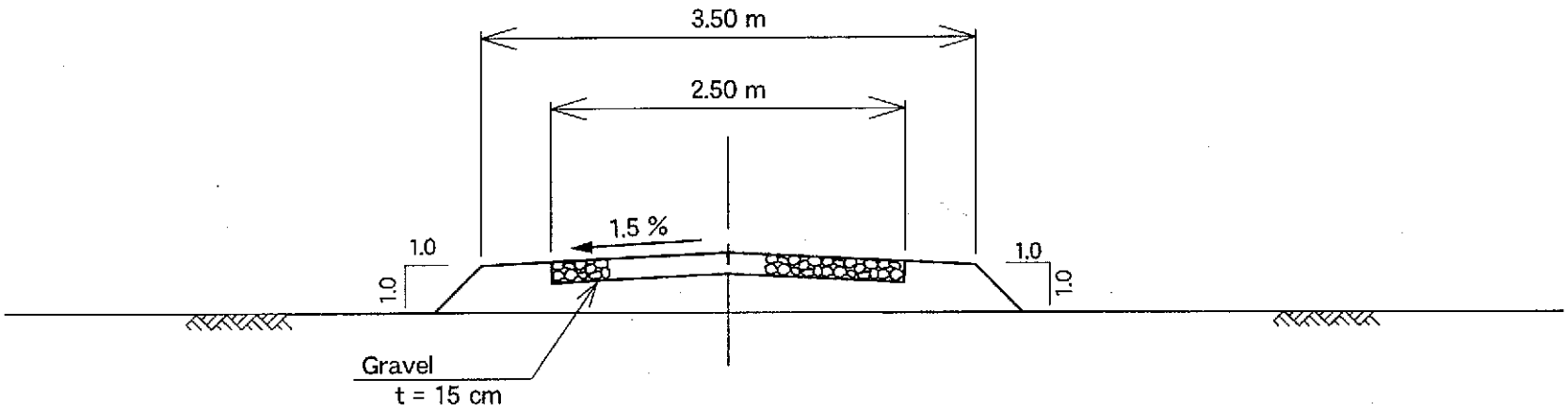
San Manuel - Sta Maria Rd (S4, S6)	3,000.00 m
San Manuel - Pangai Sur Rd (S2)	1,200.00 m
San Manuel - Villa Fermin rd (S5)	1,100.00 m
San Manuel - San Antonia Rd (S1)	1,300.00 m
San Manuel - Sta Ano Rd (-)	1,600.00 m
San Manuel - Pangal Sur Rd (S3)	600.00 m
Total	8,800.00 m

These roads planned connect from the farm and to communities or farmhouses, and are classified as farm road. The road section will have a width of 2.5 m gravel road with the shoulders of 0.5 m on both sides. (refer to Figure 4-4-1 and section 6.1.4 in Chapter 1 of this report).

(3) Implementation Schedule

The Barangay will manage the farm road. The capability building program in the Barangay will start in the first (1st) year of the short term development period. Consequently, the capability of the Barangay officials for the operation and maintenance is expected to improve in the second (2nd) year. The introduction of the farm roads, therefore, will start in the second (2nd) year of the short term development stage, and will be carried out at the rate of 1.0 km a year.

Figure 4-4-1 STANDARD DRAWING OF FARM-TO-MARKET ROAD



Production Road

4.5 Farmers' Organization Development Scheme

(1) Objective

The objective of development is to increase organizational vitality of San Manuel MPCI from "Vibrant" to "Area-wide Cooperative".

(2) Contents

1) Incorporation of penalty and incentive system to the existing MPCI policy should be undertaken including consideration of loan collection system.
2) It is necessary to introduce the palay trading after the accumulative CBU exceeds 500,000 pesos. It is estimated to realize after the year 2003. Taking into consideration the low demand of mechanical dryer among members, the MPCI should own a warehouse in order to sell the produce (Palay and corn) in bulk to traders. Planning of the facility is commenced one year before construction. The first operation should be the stock of CBU provided in kind and sell it collectively.
3) It is recommended to start an agro-processing project after the MPCI repays 70 % of the existing loan. It is estimated to realize after the year 2011 on the condition that the repayment is being continued constantly.
4) Establishment of network with other good standing MPCIs is undertaken after 10 years time, and the MPCI should start barter trading with counterparts. For example, San Manuel MPCI forwards rice and corn, and instead the counterpart hauls vegetables and fruit
5) Likewise, the MPCI will gradually expand the business.

(3) Schedule

Component	Description	Outputs/Returns	Agency	Conditions to be implemented
<Short Term Development Plan>				
Revision of co-operative by-Law	Including policy on introduced projects	Formulation of coop regulations	DAR,NGO	
Advanced training	Accounting, bookkeeping, etc	advanced skill for business	Related agencies	The field is determined based upon the request from coop
Increase member and expand coop size	Promotion campaign	Increase CBU toP600,000		
<Medium Term Development Plan>				
Improving of business structure	Start palay trading under the advice from business consultant	Positive turnover from the coop's project	DAR	The business consultant should be procured by DARCO
Increase member and expand coop size	Promotion campaign	Increase CBU toP1,000,000		
<Long Term Development Plan>				
Network formulation with other coops	Barter trading	Grow to area-wide cooperative		

(4) Support System

To strengthen management capability, the following training should be applied.

1) Leadership training for officers by DAR (2 persons x 1 week x 2 years)
2) Skill up training on accounting, auditing, and bookkeeping by CAVALCO (3 persons x 2 weeks)

4.6 Development Support Scheme

4.6.1 Rural Credit Plan

The MPCI should pay a total of 2,400,000 pesos of debt during short term development period. New loans should not be provided to them until 70 % of existing debt is paid. Simultaneously, the MPCI should put a target to accumulate 500,000 pesos of CBU within first five (5) years, and one million pesos within the period of long term development.

Microfinance (MF) will be applied to the segment whose income decreases by the development. Especially, it is recommended to implement this scheme by Diocese of Isabela Province toward Cursillo, which consists of those who are carrying farm produce to Barangay at present, because they seem to reduce income by the construction of a farm-to-market road. Further, MF should be provided to female organizations (San Manuel RIC) in order to establish a business on simple food processing. Primarily the NGOs should carry out this MF. It is recommended that the first step which requires a little amount of fund will be started by BIDANI, and then transfer the donor to CAVALCO after each member loan exceeds to 15,000 pesos that resulted from the good achievement in loan payment by the organization.

When the accumulative CBU exceeds 500,000 pesos that will probably occur in Medium Term Development period, the MPCI should register to GPC as cooperative member. By doing so, the cooperative can expect diversified loan sources, and consequently, it can form a financially strong body toward emergency.

4.6.2 Livelihood Development Plan

Livelihood development plan in this ARC includes livestock & poultry development, backyard gardening, fish culture and mushroom culture. Considering it is required to improve the home economy as soon as possible, these projects will be put into practice in the first year in the Short Term. Animals such as cattle/Carabao, swine, goat and poultry will be raised under the livestock & poultry development plan. It will employ a revolving method, called 'Animal Dispersal Plan'. An NGO will lead the project in the first year in the Short Term Development Plan, and Barangay Council will manage it later. The backyard gardening will be disseminated to women in the ARC. A demo-farm shall be established one each at a Purok. Extension workers will give practical training and the skills will be dispersed to other farmers. The extension workers will provide seed for demonstration purposes. The project will be carried out in the first three (3) years.

Fish culture will be led by NGO. Agricultural extension workers will judge the land topographically, and fishpond will be constructed with SFR project in the first year. Fish raising will start in the second year with the fry provided by CVROSFR free for three (3) years. The grower shall purchase the fry by himself after that period. Mushroom culture will be extended to women practically with the skills taught by extension workers. The extension workers shall be trained first at RCPC. This project will be executed from the first year. The seed fungus will be provided by RCPC for free in the first year, and the growers shall buy it by themselves later.

4.6.3 Management Capability Building Plan

The details of the Plan are shown in 6.3.3 of the Part 1. The objective of this Plan is to increase the management capability of the agencies' staff as well as the farmer beneficiaries through the training for the effective and efficient implementation of the proposed development plans. The training will principally be conducted at the municipality level. The target agencies' staffs are the DARPO's staff, government officials of line agencies and LGUs, NGO staff and so on. The target farmer beneficiaries are mainly Barangay officials. All the training programs will be implemented within two (2) years after the commencement of the project implementation. The impact survey at the end of the second (2nd) year will review and determine if the training programs need to be continued.

The training programs included in the Plan are: (1) Development Planning, (2) Planning Workshop cum Training, (3) Monitoring and Evaluation, (4) Training to Trainers and (5) Project Management (Social Preparation).

4.7 Implementation Plan

As shown in 6.8.3 " in Part 1 of this report, the first development priority will given to "Management Capability Building Plan", "Farmers' Organization Strengthening Plan" and "Rural Credit Plan" to improve farmer's and MPCI's management capabilities. Therefore, they should be started before all others plans. "Livelihood Development Plan" will be carried out for individual farmers. Although this will directly contribute to the improvement of living standard of the farmers, there have been several similar projects and there seems no need of specific new instruction and training. These four (4) plans will start at the first (1st) year in the short-term development period.

"Management Capability Building Plan" will be carried out for two (2) years in the short term development period. As the management capability building of the LGU and promotion of agricultural technology to agricultural extension workers will be achieved in the first year. The components managed by Barangay, such as multi purpose solar dryer (including multi-purpose pavement) in the framework of "Prost Harvest Facility Development Plan", "FTMR development" and "Agriculture Development Plan" will follow. "Agriculture development" is to be undertaken with the assistance of DA. The construction of the multi purpose dryer will be promoted with the assistance of LGU who will supply materials, labors

and construction machines. Through the process of construction and supervision, the farmers of the Barangay will themselves improve their technology, management and maintenance skill. Considering this, the works will be carried out for the long period. After the improvement of capabilities of LGU, LGUs or the Barangay will carry out FTMR Development on the contract basis. The work will start in the second year like that of the multi purpose dryer.

The MPCI will be in charge of the management and maintenance of the warehouse as well as its construction. In consideration of this, the construction of the warehouse will start at a time when the MPCI is prepared to take up the work, and the CBU has come up to more than 200,000 peso (2nd year from the beginning of the short-term development program).

The implementation schedule of each component for the San Manuel ARC is shown in Figure 4.7.1.

4.8 Operation and Maintenance Plan

The multi purpose solar dryer under the Barangay management shall be maintained through the rental charges that will be collected from the users. Barangay will decide the amount of the rental charge. They shall be kept in "Special Account of Solar Dryer" and used shall be utilized for the repair of the facility as necessary.

The management and maintenance of the warehouse shall be managed and maintained by the MPCI.

LGU will be in charge of the management and maintenance of the roads, and beneficiaries of the farm road shall be responsible for the expenses of fuel for a machine, supply of labor and snack under the existing rule of LGU.

4.9 Project Cost

The unit costs/prices are determined considering the recent projects executed by the line agencies and NGOs in June 2000. Exchange rate based on the average rate for three months from March to May 2000 are applied for this estimate.

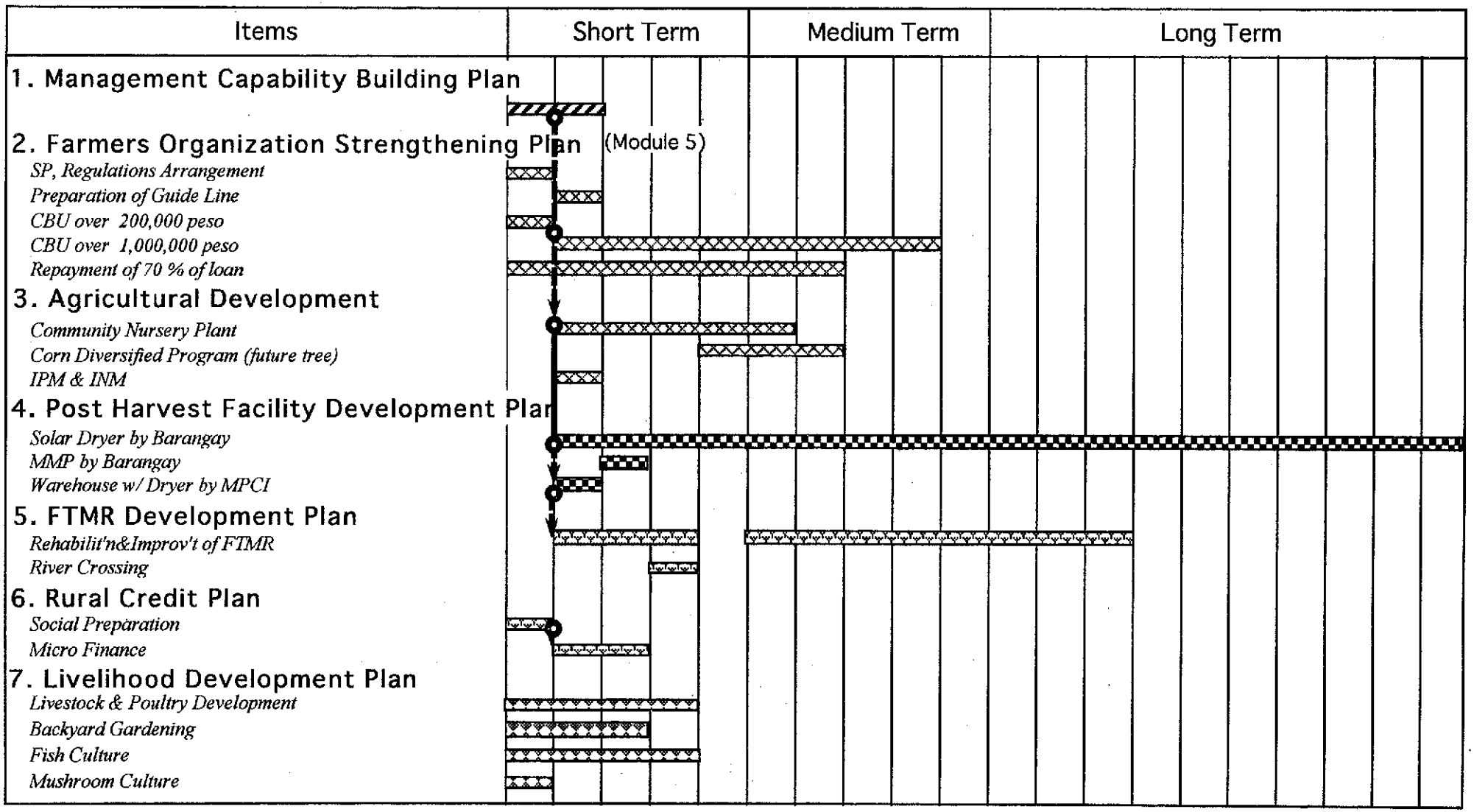
1.0 US$ = 42.0 pesos = 106.0 yen
For cost estimate, the following assumptions are applied:

Administration Cost:	8 %	of direct construction cost
Physical Contingency:	10 %	of costs such as direct construction cost, administration cost

For estimate of price contingency, the annual price escalation rate of 2.0 % for the foreign currency portion is used based on the average rate for advanced five (5) countries. The annual price escalation rate of 9.4 % for the local currency portion used is based on the average rate for one (1) year from July 1998 to June 1999.

Figure 4-7-1

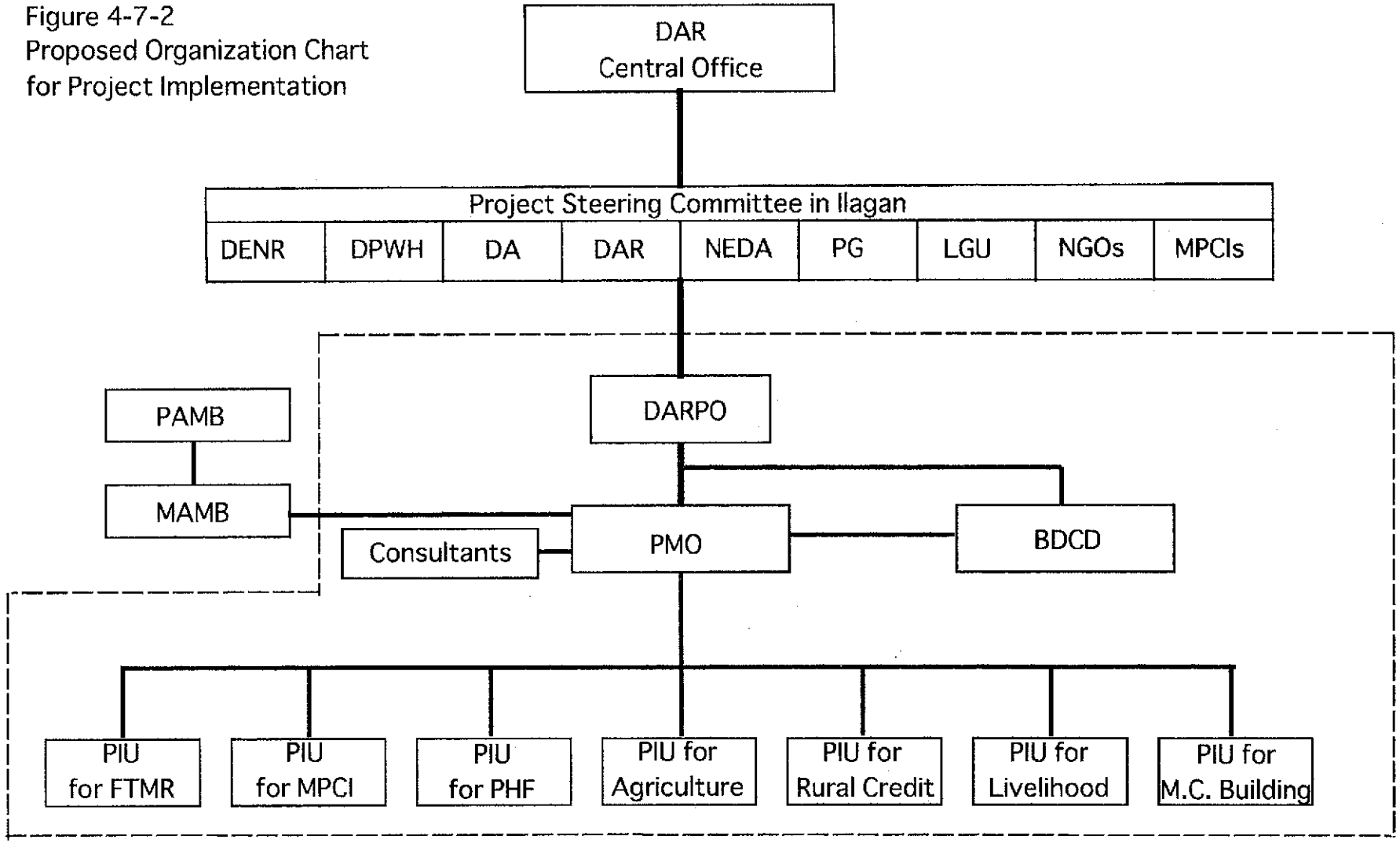
Tentative Implementation Schedule
(San Manuel ARC)



Source: JICA Study Team

FN:実施工程(S-Manuel)

Figure 4-7-2
Proposed Organization Chart
for Project Implementation



Note: PMO - Project Management Office
PIU - Project Implementation Unit
PHF - Post Harvest Facilities
FTMR - Farm to Market Road
MAMB - Municipal Agrarian Reform Management Board
PAMB - Provincial Agrarian Reform Management Board
M.C.Building - Management Capability Building
MPCI - Multi-Purpose Cooperative Inc.
BDCD - Beneficiaries Development and Coordination Division
DARPO - Department of Agrarian Reform Provincial Office

The total project cost amounted to 221 million pesos. The necessary project costs by short, medium and long term development period are 158 million, 20 million and 43 million pesos, respectively. (refer to Table 4-9-1)

The operation and maintenance costs consist of fuel costs and electricity of facilities, repair cost of the offices and labor costs, O&M and general management costs. For physical contingency, the assumption applied is 10 %. The necessary operation and maintenance costs by short, medium and long-term development period are 70 thousand, 500 thousand and 1,130 thousand pesos, respectively. (refer to Table 4-9-2)

Table 4-9-1 Project Cost

unit : '000 pesos

Development Plan	Quantities	Short Term			Medium Term			Long Term			Total		
		LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Agriculture Development Plan		148	0	148	7	0	7	0	0	0	155	0	155
1.1 IPM &INM Training	1 L.S	17	0	17	0	0	0	0	0	0	17	0	17
1.2 Community plant nursery	1 L.S	129	0	129	5	0	5	0	0	0	134	0	134
1.3 Crop diversification (perennials)	1 L.S	2	0	2	2	0	2	0	0	0	4	0	4
2. Irrigation Development Plan	0 ha	0	0	0	0	0	0	0	0	0	0	0	0
3. Post-Harvest Development Plan		5,900	3,743	9,643	2,521	1,741	4,262	5,042	3,482	8,524	13,463	8,966	22,429
3.1 Solar Dryer by Barangay (1)	5,823 sq.m	2,521	1,741	4,262	0	0	0	0	0	0	2,521	1,741	4,262
3.2 Multi Purpose Pavement	400 sq.m	103	73	176	0	0	0	0	0	0	103	73	176
3.3 Solar Dryer by Barangay (2)	5,823 sq.m	0	0	0	2,521	1,741	4,262	0	0	0	2,521	1,741	4,262
3.4 Solar Dryer by Barangay (3)	11,645 sq.m	0	0	0	0	0	0	5,042	3,482	8,524	5,042	3,482	8,524
3.5 Solar Dryer by Cooperative	5,610 sq.m	2,429	1,678	4,107	0	0	0	0	0	0	2,429	1,678	4,107
3.6 Mechanical Dryer	70 cavan	367	41	408	0	0	0	0	0	0	367	41	408
3.7 Warehouse	300 sq.m	480	210	690	0	0	0	0	0	0	480	210	690
4. Farm-to-Market Road Development Plan		395	375	770	569	543	1,112	234	222	456	1,198	1,140	2,338
4.1 San Manuel - Sta Maria Road	3.0 km	219	209	428	219	208	427	0	0	0	438	417	855
4.2 San Manuel - Pangal Sur Road	1.2 km	88	83	171	87	84	171	0	0	0	175	167	342
4.3 San Manuel - Villa Fermin Road	1.1 km	0	0	0	161	153	314	0	0	0	161	153	314
4.4 San Manuel - San Antonio Road	1.3 km	88	83	171	102	98	200	0	0	0	190	181	371
4.5 San Manuel - Sta. Ano Road	1.0 km	0	0	0	0	0	0	146	139	285	146	139	285
4.6 San Manuel - Pangal Sur Road	0.6 km	0	0	0	0	0	0	88	83	171	88	83	171
5. Farmers' Organization Development Plan	1 L.S	629	167	796	122	3	125	0	0	0	751	170	921
6. Rural Credit Plan	1 L.S	0	0	0	885	707	1,592	1,884	1,012	2,896	2,769	1,719	4,488
7. Livelihood Development Plan		203	0	203	0	0	0	0	0	0	203	0	203
5.1 Livestock & poultry development	1 L.S	164	0	164	0	0	0	0	0	0	164	0	164
5.2 Backyard gardening	1 L.S	7	0	7	0	0	0	0	0	0	7	0	7
5.3 Fish culture	1 L.S	28	0	28	0	0	0	0	0	0	28	0	28
5.4 Mushroom culture	1 L.S	4	0	4	0	0	0	0	0	0	4	0	4
8. Management Capability Building Plan	1 L.S	162	396	558	10	40	50	0	0	0	172	436	608
9. Operation and Maintenance Equipment	1 L.S	7,887	62,184	70,071	0	0	0	0	0	0	7,887	62,184	70,071
10. Consultant Service Fee	1 L.S	10,071	23,947	34,018	887	2,922	3,809	0	0	0	10,958	26,869	37,827
Sub-Total		25,395	90,812	116,207	5,001	5,956	10,957	7,160	4,716	11,876	37,556	101,484	139,040
Administration Cost (8%)		2,031	7,266	9,297	400	476	876	573	376	949	3,004	8,118	11,122
Sub-Total		27,426	98,078	125,504	5,401	6,432	11,833	7,733	5,092	12,825	40,560	109,602	150,162
Physical Contingencies (10%)		2,742	9,809	12,551	541	642	1,183	776	507	1,283	4,059	10,958	15,017
Sub-Total		30,168	107,887	138,055	5,942	7,074	13,016	8,509	5,599	14,108	44,619	120,560	165,179
Price Escalation		10,703	8,532	19,235	6,071	1,035	7,106	27,217	1,996	29,213	43,991	11,563	55,554
TOTAL		40,871	116,419	157,290	12,013	8,109	20,122	35,726	7,595	43,321	88,610	132,123	220,733

Table 4-9-2 Operation and Maintenance Costs

unit : '000 pesos

Development Plan	Short Term			Medium Term			Long Term			Total		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Irrigation Development Plan	0	0	0	0	0	0	0	0	0	0	0	0
2. Farmers' Organization Development Plan	15	0	15	3	0	3	0	0	0	18	0	18
3. Rural Credit Plan	0	0	0	319	0	319	638	0	638	957	0	957
4.Others	49	0	49	128	0	128	392	0	392	569	0	569
Sub-Total	64	0	64	450	0	450	1,030	0	1,030	1,544	0	1,544
Physical Contingencies (10%)	6	0	6	46	0	46	104	0	104	156	0	156
TOTAL	70	0	70	496	0	496	1,134	0	1,134	1,700	0	1,700

4.10 Project Evaluation

4.10.1 Farm Budget Analysis

Farmers at the San Manuel ARC earn the majority of their income from double crops of paddy, but only a single crop of corn. The farm budget analysis of these major crops at is shown in Tables J-67A to J-69A in Appendix J. Other minor crops produced at the San Manuel ARC are banana, pineapple, mango, avogado, santol and calamansi. Gemelina is suggested for environmental purpose and wood by-product. Only pig fattening and backyard poultry raising are suggested for livestock raising at San Manuel. The farm budget analysis of all these minor crops as well as backyard livestock raising are in Tables J-4A to J-29A in Appendix J.

The net production values (NPV) of most annual crops (rice, corn, beans, vegetable) produced at San Manuel are positive. Except banana, other fruit trees give negative NPV for all the first four (4) to six (6) years, and positive NPV afterwards. The NPVs of pig and poultry raising are negative in the first year and positive later on.

4.10.2 Project Evaluation

(1) Financial Analysis

The financial analysis of the San Manuel ARC is based on the same set of assumptions as four other Model ARCs. The financial analysis of the San Manuel ARC concludes a much lower FIRR than all other Model ARC. It would require at least an annual growth in income of eleven (11) % instead of five (5) and ten (10) % assumed earlier.

(2) Economic Evaluation

Economically, there are two ways of deriving the Economic Internal Rate of Return (EIRR) of a project. One is to apply the Standard Conversion Factors (SCF) to the financial prices of all inputs and outputs used in the analysis. The other is through applying the Shadow Exchange Rate (SER). Algebraically, the relation between the SCF, SER, the Official Exchange Rate (OER) and the Foreign Exchange Premium (FX) are as follows:

$$SER = OER \times (1 + FX\ premium) = OER/SCF$$

$$SCF = 1/(1 + FX\ premium) = OER/SER$$

While SCFs are generally used for an internationally financed project, the requirement of the NEDA/ICC is that the SERs be used in deriving the EIRR to any

project submitted for its consideration. The suggested values of the two are currently given by NEDA are given below;

Variables	International Standard	NEDA/ICC
1. Foreign exchange rate	OER	Shadow exchange rate
2. Conversion factors	SCF	SER
3. Tradable items	SCF = 1.0	SER= 1.2
4. Non-tradable items	SCF = 0.8	SER= 1.0
5. Unskilled labor	SCF = 0.6	SER= 0.6

The two (2) major food grains in the San Manuel ARC, namely, rice and corn, are regarded as tradable items in the economic analysis of this report.

Apart from the EIRR calculated on the basis of the SER, another sets of EIRR calculated based on the SCF are as follows. In general, the EIRRs derived from the two factors are very close. Possible deviations from each other are due to the different proportion of the tradable and non-tradable inputs applied and output produced. (refer to Table J-77C in Appendix J)

Results of EIRR Calculation (%)

Case	San Manuel ARC	
	w/ SER	w/ SCF
Low	6	19
High	15	27

4.10.3 Financial Viability of Implementing Agencies

The financial viability of the Echaque Municipality, where the Minagbag ARC is, in terms of its Net Loanable Allowance (NLA) is shown in Table J-78A in Appendix J. It is higher than the proposed project development costs in every year.

4.10.4. Initial Environmental Examination (IEE)

The proposed ARC development plan consists of the agriculture development, post-harvest development, farm-to-market road development, farmers' organization development, rural credit, and livelihood development plans and management capability building. The development plans are covered by the environmental checklist. (refer to Table 4-10-1)

These development plans will not have serious impact on the present environment condition, because the development plans proposed are small in scale.

Consequently, Environmental Impact Assessment (EIA) is not necessary. The impacts of the proposed ARC development plans are presented as follows:

(On Socio-Economic Environment)

- Income gap is observed between developed and undeveloped ARCs. However, the proposed development plans when implemented will reduce the gap.
- Existing system/custom and social structures will gradually be changed by the farmer's organization development plan. However, since the development plan will only strengthen the existing multi purpose cooperatives, the impact may not be extensive.

If the existing farming practices will continue, it will have a negative impact on the existing environment. The following environmental conservation measure will be considered in the implementation of the proposed development plans:

- Extension of Integrated Pest Management (IPM) to decrease utilization of chemicals and pesticides.
- Conversion of perennials crops from existing crops where soil erosion occurs to stabilize farm management and prevent soil erosion.

Table 4-10-1 Environmental Checklist

Activities of Construction / Environmental Issues	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
I. Socio-economic Environment													
1. Social Life													
(1) Living													
- Planned resettlement													
- Non-spontaneous resettlement		C	C	C	C	C	C	C	C				
- Change in life style	C	C	C	C	C	C	C	C	C	C	C	C	
- Friction among inhabitants	C	C	C	C	C	C	C	C	C	C	C	C	
- Indigenous people / Minority / Nomad													
(2) Population													
- Population increase													
- Sudden change in population composition													
(3) Economic activities													
- Shift of economic activity base	C	C	C	C	C	C	C	C	C	C	C	C	
- Shift in / economic activities unemployment	C	C	C	C	C	C	C	C	C	C	C	C	
- Expansion of economic gap	B	C	C	C	C	C	C	C	C	B	B	B	
(4) Institution / Custom													
- Resettlement of water right / fishery right		B	B									C	
- Change in social structure (e.g. organization)	C	C	C	C	C	C	C	C	C	B		C	
- Restructuring of existing system / custom.	C	C	C	C	C	C	C	C	C	B		C	
2. Health / Sanitation													
- Increase in pesticide use	C											C	
- Outbreak of endemic disease	C	C	C	C	C	C	C	C	C			C	
- Spread of infectious illness	C	C	C	C	C	C	C	C	C			C	
- Accumulation of residual toxic (e.g. pesticides)													
- Increase in waste / excrement													
3. Historic spot / Cultural heritage / Scenery													
- Damage and destruction of historic spot / cultural heritage		C	C	C	C	C	C	C	C				
- Loss in important landscape or scenery	C	C	C	C	C	C	C	C	C			C	
- Impact to buried cultural assets		C	C	C	C	C	C	C	C				

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

: not applicable

(Continue)

Table 4-10-1 (Continued)

Environmental Items \ Activities of Construction	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organaization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
II. Natural Environment													
4. Valuable life / ecological area													
- Change in vegetation	C	C	C	C	C	C	C	C	C			C	
- Impact to scarce or specific animal or plant species													
- Diversity of species	C	C	C	C	C	C	C	C	C			C	
- Penetration / Propagation of a harmful life	C	C	C				C	C	C			C	
- Extinction of wetland / peat bog													
- Extinction of tropical forest / wild land													
- Destruction of mangrove forest													
- Destruction of coral reef													
5. Soil / Land													
(1) Soil													
- Soil erosion	C											C	
- Salinization of soil	C											C	
- Fall in soil fertility	C											C	
- Soil contamination	C	C	C				C	C	C			C	
(2) Land													
- Land degradation (including desertification)	C	C	C				C	C	C			C	
- Hinterland degradation	C	C	C				C	C	C			C	
- Land subsidence	C	C	C	C	C	C	C	C	C			C	
6. Hydrology / Water quality													
(1) Hydrology													
- Change in surface runoff	C	C	C	C	C	C	C	C	C			C	
- Change in groundwater runoff / level	C	C	C	C	C	C	C	C	C			C	
- Inundation / Flood	C	C	C	C			C	C	C			C	
- Soil deposit	C	C	C				C	C	C			C	
- Fall in riverbed													
- Shipping													
(2) Water quality / Water temperature													
- Water pollution / degradation	C	C	C	C	C	C	C	C	C			C	
- Eutrophication	C	C	C	C	C	C	C	C	C			C	
- Change in salt-water													
- Change in water temperature	C	C	C	C	C	C	C	C	C			C	
(3) The air													
- Air pollution	C	C	C	C	C	C	C	C	C			C	

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

▨ : not applicable

Chapter5

La Suerte Cluster

(Isabela Settlement ARC)

Chapter 5 La Suerte Cluster (Isabela Settlement ARC)

5.1 Category of the ARC

Based on the ARC classification and clustering, La Suerte Cluster is categorized as follows:

Area	Geographic Condition	Possibility of Irrigation Development	Current Irrigation Facilities	LTI (%)	Strategic Vitality of Farmers Organizations: Current Condition and Motion
Marginal Area	Almost hilly	No	—	100	High vitality and moving upward

5.2 Present Condition and Problems

5.2.1 Agriculture

(1) Present Condition

This cluster is composed of five (5) Barangays. It is characterized as undulated hills planted mainly with corn. The cornfield is 882 ha. Banana is grown at the periphery of the cornfield and along the streams totaling to about 17 ha. Rice is grown only at 193 ha at the bottom of the valley and is for local consumption. Pineapple planting has just started and it grows only in a small field. A farmer holds about 4.3 ha of farmland on the average, double with that of other ARCs. Soil is eroded heavily in the cornfield at the slope. Four (4) Barangays except La Suerte are hard to reach by car; San Vicente and San Marcelo, very difficult and Buena Vista and Victory, impossible to carry farm products from the farm by car to the market.

Corn is grown twice a year from May to October and from November to April. Its yield is 75 cavan/ha during the rainy season and 71 cavan/ha during the dry season. Total production is 128,772 cavans (6,440 MT) a year in the whole Cluster. Many farmers have negative profit from corn growing (Sayad) at the remote area without road such as Victory. Palay yields is 64 cavan/ha during the rainy season and 61 cavan/ha during the dry season with irrigation water from the spring etc., and 51 cavan/ha at the rainfed paddy. Banana can be harvested anytime of the year, but it is very hard to carry them to the market during rainy

season. The farmers planting pineapple, mango and Gmelina are increasing just recently in the Cluster. Cassava, mung bean and sweet potato are also planted although in a small scale only. A few fruit trees are grown at the backyard. Animals are kept in a small scale at the homestead. Carabao is very important here not only to plow the field but also to pull a sleigh in carrying farm products. Main farm produces in this Cluster are as follows:

Crops	Wet sea. (ha)	Dry sea. (ha)	Wet sea. (cavan/ha)	Dry sea. (cavan/ha)	Wet sea. (cavan)	Dry sea. (cavan)	Total (cavan)	Total (MT)
Rice	193	179	64,51	67	12,170	11,993	24,163	1,208
Corn	882	882	75	71	66,150	62,622	128,772	6,439
Banana	17		f 120					f 2,040

Note: f stands for finger ('000)

(2) Problems

The biggest problem in the Cluster is inaccessibility to the market. It limits also size of farming from poor access to market like San Vicente. It is clear that the road condition gives many disadvantages to farming in the Cluster. Most of farmers have debt to only one (1) private trader for farm input and living expenses like education. Drying facilities are not well equipped that farmers are obliged to sell wet grains at cheaper price. Soils are eroded heavily at the slope, and even landslides are observed from bare cultivation. There are unused farmlands remained here and there.

5.2.2 Agriculture and Rural Infrastructures

(1) Present Conditions

a) Irrigation

Irrigation in La Suerte Cluster is provided through only two (2) units of small pumps in La Suerte Barangay. Other irrigation from small creek serves water to a small farmland. The Cluster has undulating topography, but there is no possibility of irrigation in the ARC Cluster

b) Post Harvest Facilities

The post harvest facility available in the Cluster is presented in the following Table.

Name of cluster	La Suerte			Buenavista			Victory		
	No.	Size	Area	No.	Size	Area	No.	Size	Area
M. P. S. Dryer	6	15 x 28 m	1,680 sq.m	0	-	-	0	-	-
M.P Pavement	4	80 x 4 m	1,280 sq.m	1	70 x 4 m	280 sq.m	0	-	-

Name of cluster	San Marcelo			San Vicente		
	No.	Size	Area	No.	Size	Area
M. P. S. Dryer	1	15 x 28 m	420 sq.m	1	15 x 28 m	420 sq.m
M.P Pavement	0	-	-	0	-	-

Note: M.P.S: multi purpose solar M.P: multi purpose

There is neither a warehouse nor a mechanical dryer in La Suerte Cluster.

c) Farm Road

The road length in La Suerte, Victory, San Marcelo, Buenavista and San Vicente are 18 km, 1.4 km, 4.5 km, 1.5 km and 2.5 km, respectively. Most of them are unpaved.

The routes from each Barangay to Angadanan, the poblacion of the municipality are as follows:.

Poblacion ---------La Suerte----------Buenavista---------Victory
Poblacion----------La Suerte---------- Buenavista--------- San Marcelo
Poblacion---------San Vicente

The condition and length of the roads within the cluster area as follows:

Name of cluster	La Suerte	Buenavista	Victory	San Marcelo	San Vicente
concrete-paved	2.0 km	2.0 km	2.0 km	2.0 km	2.0 km
gravel paved	11.0 km	13.0 km	13.0 km	13.0 km	3.0 km
unpaved	-	1.0 km	3.0 km	4.5 km	2.5 km
Total	13.0 km	16.0 km	18.0 km	19.5 km	7.5 km

The bridge over the Sinalugan Creek between Barangay La Suerte and Buenavista was swept away by the flood. Before the flood, jeepney service was available to Buenavista and Victory. At present, the passage of vehicles is impossible. San Marcelo has a connecting road in the south, but it is so steep that only vehicle of high power car such as a 4WD car can pass the road even during the dry season. During the rain season, no vehicle can pass through the road.

(2) Problems

The growth of the crop depends almost on rain. Crop production in the Cluster area is low. There is no possible water source for the irrigation in the Cluster.

The shortage of drying facilities has compelled the farmers to sell the crop without drying thus reducing the income by about 2.0 pesos/kg.

Entry to the Cluster during the rainy season is difficult. Therefore, palay in the rainy season may not be timely harvested due to the difficulty to bring the thresher to the farm. If not harvested within the desirable period of one week, the quality of palay deteriorates and sale price comes down. Even when the threshers are carried into the farmland, cost of transporting becomes higher. Also, transportation of the produce has to depend on lots of labor through the long, muddy and soft paddy field.

5.2.3 Farmers' Organization

(1) Present Situation

The La Suerte Cluster consists of five Barangays, two of which have cooperatives. The La Suerte MPCI, which is in the Barangay of the same name, has about 140 members and 76,000 pesos in CBU. The San Marcelo MPCI, which was established in Barangay San Marcelo in 1998, has 75 members, but has not yet registered with the CDA and also has almost no CBU accumulation.

The La Suerte cooperative was founded in 1995. Having started out with 27 members, it gradually accumulated CBU and began offering loans to members from admission fees received at the time of its foundation. However, a drought in the same year made it impossible for some of the members to repay these loans. This triggered a dispute within the organization that resulted in the withdrawal of several of the members who had defaulted on their debt from the cooperative. Upon the addition of some new promoters, the cooperative was reorganized and made a fresh start in 1996 with 30 members.

Thereafter, the cooperative was cautious about receiving loans from governmental institutions as others were doing, and there was a consensus among its membership that it should refrain from borrowing until the organization was more firmly established. There was a solid conviction that the cooperative could not rely on aid until it was strengthened. While members numbered in the range of 30 to 40 up until 1999, they increased by about 100 in that year alone[1]. It was in 1999 that the cooperative first applied for a loan (of 1.5 million pesos) from the LBP.

Although the cooperative had collected dues of 500 pesos at the end of each harvest beginning in 1996, it was compelled to lower this to 200 pesos effective 1999 for correspondence with the actual circumstances of members on various levels, whose number

[1] A DF and an extension worker from DA played an important role then. They explained the cooperative that aid from government sector will delay if organizing process delays. As a result, the MPCI increased more than 100 of new entrant in a year.

jumped in that year. It is claimed that this step enabled an increase in the number of members and greater certainty in payment of dues, but it will take more time to check the veracity of this claim. The cooperative applies a three-step procedure to encourage payment by members who are behind in their dues, as follows: 1) visit by the person in charge of accounting and the BOD to request payment, 2) announcement of the person's name at the general assembly meeting (held once a year) in the event of continued failure to pay, and 3) expulsion of the person from the cooperative if dues are not paid for three consecutive installments. Thus far, there have been no case of imposition of the penalties in the second and third steps. In addition, these penalties are viewed as "special pronouncements of the BOD" which are not set down in writing. At present, the rate of dues payment is 100 % among the senior members but only about 50 % among the newer members.

The CBU stockpile, which now amounts to about 76,000 pesos, is used for re-lending. The applicants are allowed to apply for loans at an interest rate of 20 %, in amounts that do not exceed their own CBU contributions. The appropriateness of loan amounts is decided at the monthly BOD meeting. There have been many loans in the range of 1,500 to 2,000 pesos, and the repayment period for the same is set at two harvests (one year). The re-lending begun in 1999 is already in its second round. The first round consisted of loans mainly to officials who had been members of the cooperative since 1995, and have been fully repaid.

Although the cooperative had been renting Sari Sari stores to members up to and including 1999, the new BOD decided to abolish this practice in 2000 and to confine cooperative business for the time being to the re-lending based on CBUs.

The driving force behind the cooperative is provided by the manager and roughly 30 members behind its founding. There are very strong bonds among the original members. The president and BODs were appointed by the senior members (including these originators) in 1995. As a result, the president[2] and the vice-president have a symbolic presence in the eyes of the membership; the manager makes the actual formulation of strategy. The manager was one of the founding members in 1995 and stands out among them, partly because he is more educated than the other BODs.

(2) Problems

a) Lagging organization

[2] The president is aged 47 and dropped out of high school in the first year. He has nine children and a five-hectare farm, which is about average for the ARB. He said that he did not think he would win the last election, and that he did not understand business very well because of his lack of education.

In La Suerte Cluster, a single trader handles all the products and community funding. Cooperatives have taken shape in only two of the Barangays, and it is consequently still impossible for the Cluster to completely extricate itself from trader's control.

b) Lack of common-use facilities

There is no office for calling all members together or holding meetings of the officials, and this is hindering the management of the cooperative, whose members have rapidly increased in number. Similarly, the lack of facilities such as bulletin boards has made it difficult to demonstrate the transparency of the cooperative to all, and this is another cause for concern.

c) Limits of the management system and lack of training

Having acquired about 100 new members in 1999 alone, the La Suerte MPCI, like the Epiphany MPCI described in the previous section has grown to a scale exceeding the powers of BOD management and sapping its vitality. In addition, the new members have not yet been sufficiently educated.

d) Fair and equitable re-lending

The following issue could very well surface in connection with the CBU-based re-lending implemented by the cooperative.

In the existing internal rules, there are no definite stipulations about treatment of members who do not pay their debts. Although this may not cause a big problem in the case of lending to members with a more developed awareness about the cooperative, there is no guarantee that the newest members, whose ranks rapidly swelled in the recent past, will feel any moral obligation to repay loans.

If there is not a sustained turnover of loans, some members may begin to wonder why the first ones were furnished only to officials. It may also be observed that, at present, only the person in charge of accounts handles the books; the other BOD members apparently take no interest in the bookkeeping. As such, it would not be strange if this bookkeeper were to be unjustly suspected of wrongdoing in the event of a problem.

5.2.4 Rural Economy

(1) Present Situation

In La Suerte Cluster, single trader controls the economy, and the farmers have little degree of freedom in the entire process from planting to sale of the products. The community has a total population of 3,864 in 642 households (14 % of which are ARB households). Land ownership averages 4.3 ha per household. The prices for the major products are shown below. They are close to being controlled prices managed by the single trader.

Products	Wet season	Dry season
Rice (polished)	12 pesos/kg (consumed within the region)	12 pesos/kg (consumed within the region)
Corn	6 pesos/kg (to a private trader)	6 pesos/kg (to a private trader)

Palay and corn production costs per ha are estimated at 15,275 and 17,373 pesos, respectively. Fertilizer occupies the largest share of the farm inputs; it accounts for 42 % of the total in the case of corn. Due to the underdeveloped state of production roads, the transportation cost comes to about five (5) pesos/cavan of harvest, and accounts for about one (1) % of the entire production cost.

The typical farm employed in the farm budget analysis owned 4.3 ha of land cultivated with corn. The farm budget analysis estimated farm income at 64,500 pesos, off-farm income at 3,700 pesos, and non-farming income at 500 pesos, for a total annual income of 68,700 pesos. The production cost of corn alone is estimated at 74,500 pesos. As such, the situation is one of a back spread, in that increased production would result in increased deficit.

(2) Problems

Virtually no parties have obtained accurate data for the balance of production expenditure and income (i.e., the back spread situation); the rural economy is completely in the hands of a single trader. In return for lending the farmers money, the lender takes away farmer freedom in selection of crops and/or buyers. This approach dilutes the farmer's sense of crisis about their own family budgets and sets up a relationship in which they are subordinate to the lender. While such control by a lender is a fundamental problem, there is also a problem with the conventional approach to social conditioning taken by DARPO, which has not had an accurate awareness of this situation, and also the stance of government, which neglected to focus on issues underlying poverty.

5.2.5 Problems of the Supporting Systems and Operations

The BARC was established in 1987 and active only for a few months. Since then,

no meeting was conducted by the BARC.

The BDP was prepared in 1999 initially by the Barangay officials with the help of the DF. The ARCDP was prepared in 1992 initially by the MPCI officers. Since the MPCI was not functional from 1994 to 1998, the Barangay took no follow-up activities after the planning of the ARCDP.

Besides the DF, the agency representatives visited the Barangay were only a few; a) the DA-LGU officer(s) who visited to conduct farming skills training and distribute agriculture inputs, and b) the municipal officer(s) who visited when infrastructure projects were implemented.

At the municipal level, there is no MCIT. There is the MDC, but not active. When the MARO has a problem, he therefore has to contact the Mayor.

5.2.6 Results of the Workshop

The problem tree prepared through the workshop with the Barangay people is shown in Figure 5-2-1. The direct causes of low income identified are; a) High price of inputs, b) low price of the farm products, c) low production, d) high hauling cost, and d) low quality of the products.

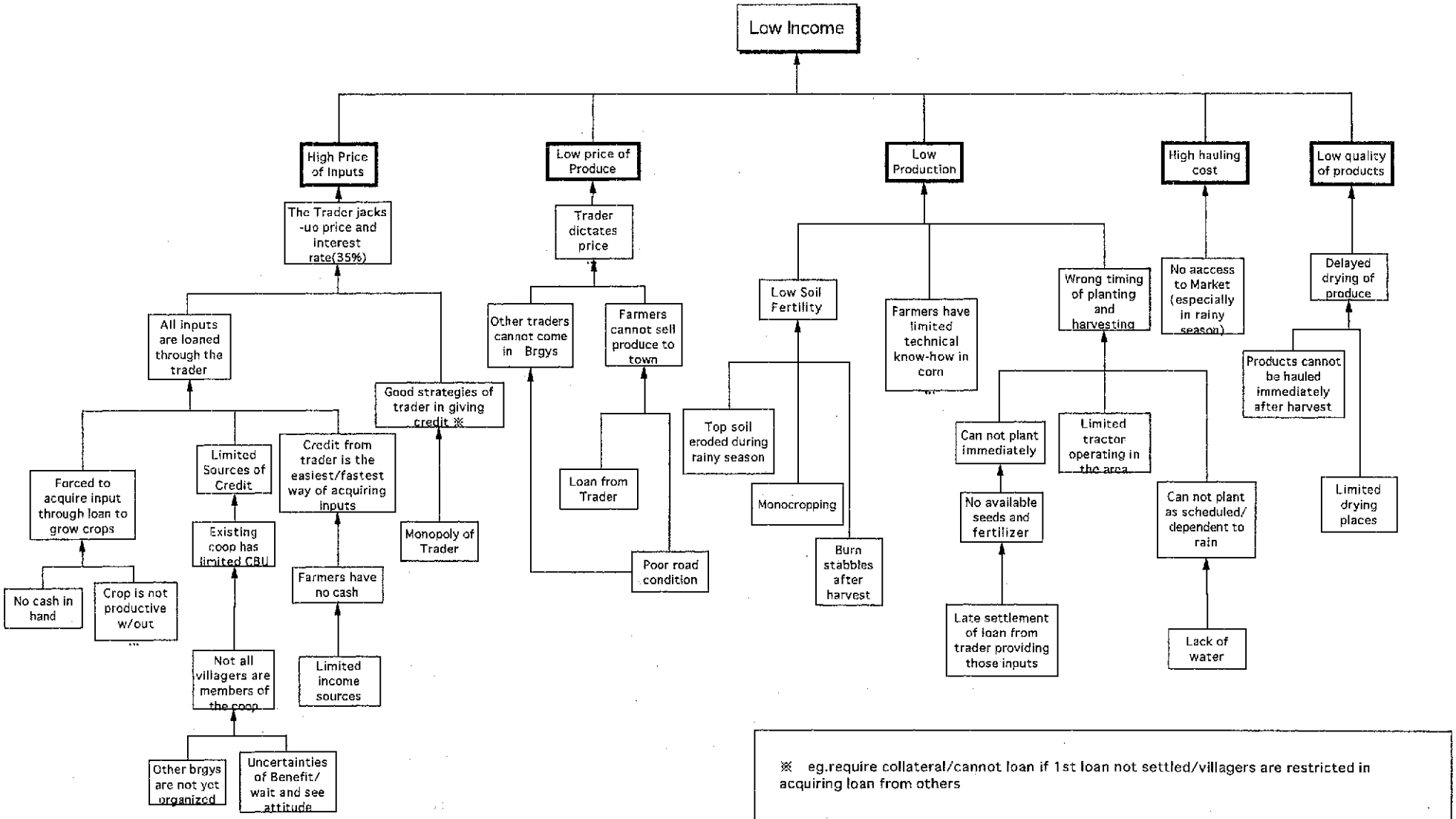


Figure 5-2-1 Problem Tree in La Suerte Cluster

5.3 Diagnosis of Organizational Culture

(1) Positioning in Context of Cooperatives in the Study Area

a) Static analysis

In terms of the diagnosis of corporate culture (DCC), the La Suerte MPCI belongs in the "Vibrant" domain. This indicates that its degrees of "Strategic-" and "Organizational Vitality" are higher than those of the average cooperative in the Study Area.

Established in 1995, the cooperative subsequently fell into the "Patay" state. Its recovery required a climb first from the "Patay" to the "Kintaro" state, and then from the "Kintaro" to the "Vibrant" state. The cooperative took the following measures in the process of the first step from "Patay" to "Kintaro" implemented in 1996.

i) Soul-searching over the events in the first year (in-depth analysis of the hows and whys of the failure)

ii) Institution of a requirement for all applications for loans and BOD's approval to be made in writing

iii) Tightening of supervision and assurance of transparency; use of the expertise of DF's to this end

In the process of the second step (from "Kintaro" to "Vibrant") over the years 1997 to 1999, there was an increase in the degree of "Organizational Vitality", which is an indicator of the extent of internal communication. The following are thought to have been background factors.

i) The senior members who founded the cooperative were reappointed to executive positions and further strengthened the unity of the cooperative. There was particularly smooth collaboration between the cooperative president and manager, mainly in business activities. This encouraged the "Delegation of Authority" without a loss of the high "Strategic Vitality".

ii) The community contains many settlers who are veterans and share a background of military service. As such, there is a shared mentality and sense of values. This helped to breed the atmosphere of free communication among members and, by extension, the "Respect Dialogue" and the "Respect for Individual".

iii) The cooperative took a considerably cautious attitude toward external assistance and upheld its policy of achieving solutions through self-help efforts. This supported the functioning of "Appropriate Rules" and "Respect for Individual" members.

According to the DCC implemented in July 2000, only the cooperative president[1] was rated as having a high degree of vitality; the BOD and officials were placed in the "Patay" or "Anarchy" domains. This is thought to be due to overstrain from duties that have already gone beyond the scope of their abilities. It also may be observed that the impression of a lack of "Appropriate Rules" in the

[1] See the footnote in Section 5.2.3 on farmers' organizations.

cooperative becomes more prevalent among higher-ranking officials.

b) Dynamic analysis

Thanks partly to the government-led campaign for an expansion of membership, the number of members increased by over 100 in the year 1999 alone. As of July 2000, the dynamic vector of the cooperative was sagging under this influence. If this situation is not remedied, the cooperative could very well fall into an "Anarchy" situation, for the following reasons.

i) The new members have not received sufficient training like PMS, etc., and have a low awareness about the cooperative. This caused the suspension of several businesses that had previously been functioning.

ii) Although the amount of CBU dues was reduced, there are no prospects for a substantial increase in the collection rate.

iii) The officials and BOD have apparently taken a “wait-and-see” attitude and did not propose any new ideas of their own even in workshops and interviews.

(2) Evolution from "Vibrant" to a "Wide-area Cooperative"

A major issue confronting the cooperative in relation to management of the membership, which jumped beginning in 1999, is a gradual decline in “Strategic Vitality” in spite of the "Vibrant" rating at the time of the DCC. To counter this decline, the cooperative must first provide elementary training for the new members and solidify the organization. Another problem is the lack of know-how and aptitude for management of the many members by the BOD and officials. If the cooperative is to achieve a area-wide status, they must be given leadership training and training in cooperative management and operation as soon as possible. It will probably also be necessary to make new appointments for personnel adapted to area-wide management.

Next, the cooperative must reformulate the internal rules and policies that serve as standards, with the agreement of the cooperative members. At present, the La Suerte Cluster does not have a single copy machine, and there is also no office that can be used in common by the cooperative. Facilities of this sort are tools for increasing the degree of transparency and promoting discussion. As the infrastructure required for operation of the cooperative, they should be immediately acquired, with assistance from DARPO. Internal rules and guidelines must be approved by the entire membership and then set down in writing, in documents that are constantly accessible to all members. Explicit provisions also must be made for incentives and penalties. The large group of new members who joined under governmental guidance must be reorganized in the process of collaborative work to these ends. To strengthen the organizing power, it is probably necessary to execute a weeding-out process that will leave only those members who subscribe wholeheartedly to the cooperative's intentions.

Of the five (5) Barangays in the La Suerte Cluster, only two (2) have, in effect, a cooperative; the La Suerte MPCI is the only functioning one in the Cluster. Efforts must be immediately initiated to construct roads and make the social preparations necessary for organization of the other Barangays.

Naturally, a gap is anticipated to arise between Barangays in respect of the pace of organization. To assist late-coming cooperatives, the La Suerte MPCI must have the corresponding management capabilities and experience as well as sound finances. In spite of its central position, however, it is currently saddled with problems in the management aspect. Moreover, the Cluster has allowed a single trader to get a position of monopolistic control. Judging from these circumstances, it will take a long time and sustained support for the Cluster to build a well-coordinated, area-wide organization.

5.4 Agriculture Development Scheme

5.4.1 Agriculture Development Plan

Many farmers in the ARC cluster are losing from corn growing due to low yield and very high production cost IPM and INM training on corn is required to increase corn yield and to reduce production cost. The training shall be given at the proposed demonstration farm season long by RCPC and extension workers at the early stage of the project. The cornfield will be reduced from 882 to 700 ha.

It is planned to diversify crops into more profitable fruits and useful trees in the Cluster. Banana will be given more importance than other crops. The target area for crop diversification is 20 % of the existing cornfield which is 182 ha. It requires a community plant nursery to provide necessary seedlings for crop diversification. The plant nursery will be set up on a 0.5 ha after the social preparation activities are finished in the Cluster. The nursery will be established with technical support from CVIARC and PENRO. The advice and training on plant propagation shall be continued for five (5) years. The nursery will be operated and managed by the Barangay Council and the seedlings shall be sold to farmers at a reasonable price necessary for the maintenance of the nursery. Extension workers will guide the planting of trees after the third (3rd) year when the seedlings are ready. Sloping agriculture should be instructed by the Bureau of Soil & Water Management Office (BSWMO) and thee extension workers to protect the soil from erosion. The technology will be disseminated together with crop diversification techniques.

Livestock development is planned in this Cluster because landholding is larger than the other ARCs and there is still unused land. It will focus on cattle raising. Ten (10) farmers will start with five (5) heads at the beginning, and 20 farmers will raise ten (10) heads of cattle each in the Long Term Development Plan. Hence, a total of 200 heads will be raised in the whole Cluster. Graminous Nepia grass will be grown as cutting fodder and leguminous Buracaria, Arakish etc. will be planted for grazing. The Provincial Veterinary Office will lead the livestock development project in coordination with CVUPROS and extension workers. They will give advice and technical support on fodder growing, selection of cattle lines, cattle raising, vaccination, artificial insemination, etc. Farm production in the Long Term Development is planned as follows:

Crops	Wet sea.	Dry sea.	Wet sea.	Dry sea.	Wet sea.	Dry sea.	Yield	Total	
	(ha)	(ha)	(cavan/ha)	(cavan/ha)	(cavan)	(cavan)	(MT/ha)	(cavan)	(MT)
Rice	193	179	74	80	14,282	14,320	-	28,602	1,430
Corn	700	700	70	70	49,000	49,000	-	98,000	4,900

Banana (f)	50	-	-	-	-	-	120	-	8,040
Pineapple	20	-	-	-	-	-	40.3	-	806
Coconut (pc)	5	-	-	-	-	-	3,000	-	15,000
Mango	5	-	-	-	-	-	7.5	-	37.5
Calamansi	5	-	-	-	-	-	18	-	90
Avocado	5	-	-	-	-	-	10.2	-	51
Cassava	2	-	-	-	-	-	8.6	-	17.2
Gmelina	80	-	-	-	-	-	-	-	-
Mahogany	10	-	-	-	-	-	-	-	-
Pasture (hds)	40	-	-	-	-	-	5	-	200

Note: f stands for finger (‘000), pc does piece, and hds does heads.

5.4.2 Post Harvest Facility Development Plan

(1) Objectives

The crop treatment facilities composed of a multi-purpose dryer, a warehouse and a mechanical dryer, aim to improve the crop quality and to increase the farmer’s income through timely sale of the crop at advantageous price. These facilities have to be introduced after the improvement of the capability of the Barangay and MPCI has been achieved.

(2) Plan for the facilities

The facility will have the capacity to dry a part of crop produced within the ARC Cluster. The amount of the produce to be stored shall be 20 % (12,888 cavan) of the total proposed production. The necessary floor area of the warehouse will be 305 sq.m. Grains to be stored in the warehouse will be dried by water content of less than 14 % at the attached solar dryer for long storage. About 75 % of the stored amount (15 % of the total production amount) will be dried at the solar dryers. The remaining are dried by the mechanical dryer, and its capacity is 30 cavan/day.

The plan for the construction plan of the drying facilities would be proposed as the following table. (refer to Appendix F)

In-charge	Kind of Drying	Ratio (%)	Planned (rice)	Drying Amount (corn cavan)	Area (sq.m)
private	garden	15	2,316	7,350	5,836
Barangay	multi-purpose dryer	65	10,036	31,850	25,286
cooperative	solar dryer	15	2,316	7,350	5,835
	mechanical dryer	5	722	2,450	-
Total		100	15,440	49,000	36,957

Multi-purpose solar dryers under the management of the Barangay will be installed in each Barangay and a warehouse under the management of MPCI in Barangay La Suerte .

(3) Implementation Schedule

In consideration of the vitality of MPCI and the capability building of the LGUs, the introduction

of the post harvest facilities will be carried out in the following schedule.

a) Solar dryer in the private gardens:

No specific schedule has been planned since this facility belongs to private individuals/farmers. However, the construction of the facilities would be expected during the short or middle term development period.

b) Solar dryers under Barangay management:

The post harvest facilities that will be managed and maintained by the Barangay will start in the second (2^{nd}) year of the short-term development stage and be completed during the short/middle term development stage. The solar dryers and multi-purpose pavement included both in the Barangay Development Plan are to be constructed at a comparatively earlier stage in the short-term development stage.

c) Warehouses (including a solar dryer and a mechanical dryer) under MPCI management:

The warehouse (including a solar dryer and a mechanical dryer) shall be managed and operated by MPCI. The construction plan of the facility shall be executed after MPCI has accumulated a CBU of over 200,000 peso, an indication of progressive activity of MPCI. Therefore, the component will be carried out during the middle term development stage.

5.4.3 Farm to Market Road Development Plan

(1) Objectives

This component will make the easy transportation of crop and contribute to the promotion of economic activity in the Cluster. The project consists of repair works of the roads between the Barangays and farmland not passable in the rainy season, and the reconstruction of the bridge across the Sinalugan Creek between La Suerte and Buenavista.

(2) Road Plan

The traffic volume between La Suerte and Buenavista road will be big as farm materials and outputs and machines as well as daily goods for villagers, to be transported on this road. This road section is planned, therefore, as the main farm roads in the district. All other roads that connect to the farms and necessary for farming, therefore, would be planned as a production road. The proposed length of each road is shown as follows. (refer to the attached drawing)

La Suerte - Buenavista (11, 13)	4,384.50 m	(FTMR)
La Suerte - Lunac (12)	1,373.40 m	(production road)
Buenavista - Victory (14)	786.40 m	(production road)
Buenavista – Marcelo	2,794.20 m	(production road)
San Vicente - Macalamat (16)	3,420.00 m	(production road)
Total	12,758.10 m	
Remarks:	main farm road	4,384.50 m
	farm road	8,374.10 m

The FTMR will have a 5.0 m width of gravel road and the shoulder of 1.0 m on both sides. The production road will have a 2.5 m width of s gravel road and the shoulder of 0.5 m on both sides. (refer to Figure 5.4.1 and section 6.1.4 in Part 1 of this report).

(3) Execution Schedule

The Barangay will manage the farm road. The capability building program of the LGU will start in the first (1st) year of the short-term development period. Consequently, the management capability of the Barangay officials for management will be expected to improve in the second (2nd) year. The construction of the production road, therefore, will start in the second (2nd) year at the rate of 1.0 km a year.

5.5 Farmers' Organization Development Scheme

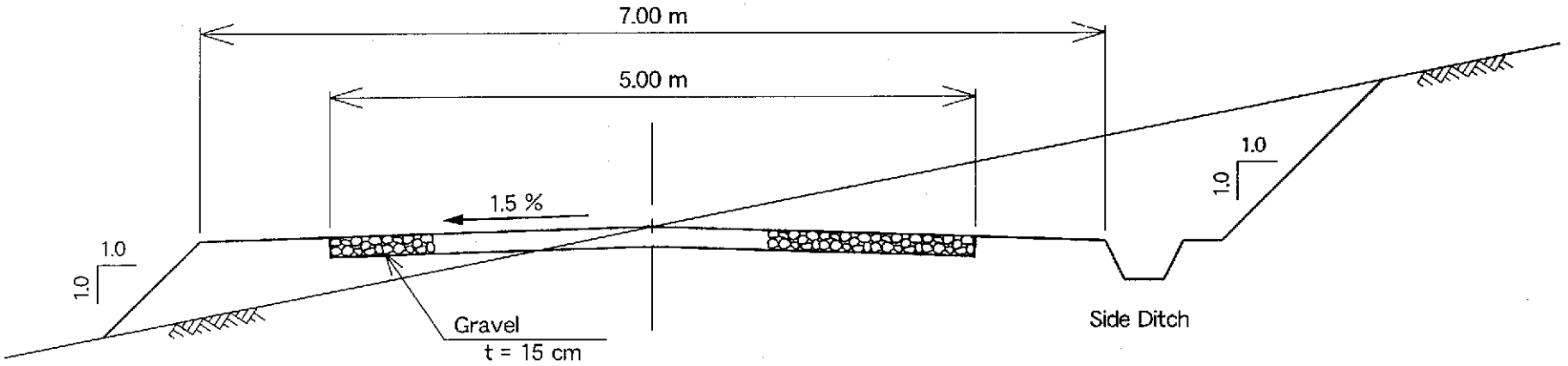
(1) Objective

The objective of development is to a) establish MPCI in each Barangay, and b) increase organizational vitality of La Suerte MPCI from "Vibrant" to "Area-wide Cooperative" after stabilizing of regulatory aspect.

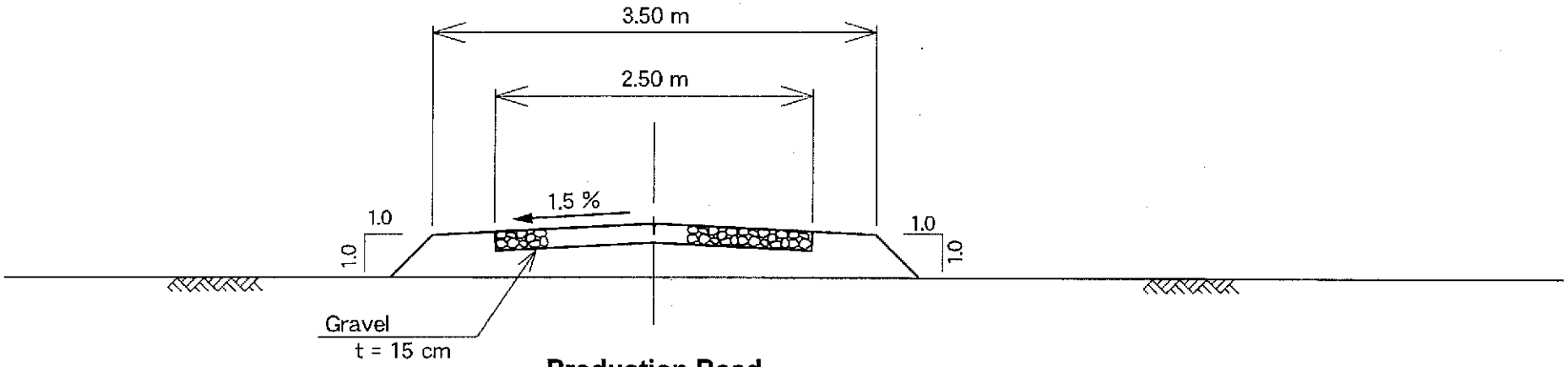
(2) Contents

1) It is necessary to apply Social Preparation to non-MPCI Barangays after construction of Barangay-to-Barangay road and establish cooperative in all Barangays.
2) Application of Pre-membership Seminar (PMS) to new entrants should be needed at La Suerte MPCI together with consolidation of MPCI policy.
3) Incorporation of penalty and incentive system should be undertaken including consideration of loan collection system at La Suerte MPCI. After this, the MPCI should procure reasonable size of loan (preferably less than 1.5 million pesos) from financial institution and relent to members in order to practice the loan repayment. If successfully repaid up to 70 % of the total, the MPCI should proceed to next step.
4) It is necessary to establish of MPCI office (50 sq.m) equipped with a copy machine and a computer at La Suerte MPCI
5) Introduction of corn trading should be planned after the accumulative CBU exceeds 500,000 pesos. Taking into consideration the low demand of a mechanical dryer among members, the MPCI should own a warehouse in order to sell the produce (corn) in bulk to traders. Planning of the facility is commenced one (1) year before construction.
6) It is recommended to establish network between the MPCIs inside the cluster as well as other outside good standing MPCIs after ten (10) years time, and start barter trading with counterparts. For example, La Suerte MPCI forwards corn, and instead the counterpart hauls vegetables and fruit.
7) Likewise, the MPCI will gradually expand the business.

Figure 5-4-1 STANDARD DRAWING OF FARM-TO-MARKET ROAD



Farm-to-market Road



Production Road

(3) Schedule

The implementing schedule is presented as follows.

Component	Description	Outputs/Returns	Agency	Conditions to be implemented
<Short Term Development Plan>				
Establish coop at every Barangays	SP, Implementation of entry project	Availability of coop at every barangays	DAR	Assign resident DF
Revision of co-operative by-Law	SP including policy on introduced projects	Formulation of coop regulations	DAR,NGO	La Suerte MPCI
Advanced training at La Suerte MPCI	Accounting, bookkeeping, etc	advanced skill for business	Related agencies	The field is determined based upon the request from coop
Increase member and expand coop size	Promotion campaign Establishment of coop office at La Suerte MPCI w/ equipment	Increase CBU toP200,000	DAR	
<Medium Term Development Plan>				
Increase member and expand coop size	Promotion campaign	Increase CBU toP600,000		
<Long Term Development Plan>				
Improving of business structure at La Suerte MPCI	Start corn trading under the advice from business consultant	Positive turnover from the coop's project	DAR	The business consultant should be procured by DARCO
Increase member and expand coop size	Promotion campaign	Increase CBU toP1,000,000		
Establish of area-wide network between other coops inside the cluster	Establish of telephone lines	Collective bargaining	DAR	Accumulative CBU reached to P1,000,000

(4) Support System

To strengthen management capability, the following training should be applied.

1) Social Preparation at non-MPCI Barangays (after Barangay-to-Barangay road construction)
2) PMS at La Suerte MPCI (3 times)
3) Leadership training for officers by DAR at La Suerte MPCI (2 persons x 1 week x 2 years)
4) Skill up training on accounting, auditing, and bookkeeping by CAVALCO at La Suerte MPCI (3 persons x 2 week)
5) Technical support on management of corn trading at La Suerte MPCI. This should be

supported by the expert[2] assigned by DARCO.

5.6 Development Support Scheme

5.6.1 Rural Credit Plan

Since the MPCI is organizationally vital, it is recommended that the provision of loan should be realized within Short Term Development period. To do this the MPCI should pursue proper steps, these are; I) application of loan, ii) establishment of consensus on payment, iii) policy formulation on payment of loan, iv) monitoring of availability of collateral, v) application of loan, and vi) payment of loan on due date. New loans should not be provided to the MPCI until 70 % of debt is paid in due manner. Simultaneously, the MPCI should put a target to accumulate 200,000 pesos of CBU within first five (5) years, 500,000 pesos within Medium Term Development period and one (1.0) million pesos within the period of Long Term Development, respectively.

Microfinance (MF) will be applied to the segment whose income decreases by the development. Especially, it is recommended to implement this scheme by Diocese of Isabela Province toward Cursillo, which consists of those who are carrying farm produce to barangay at present, because they seem to reduce income by the construction of a farm-to-market road. Further, MF should be provided to female organizations (La Suerte RIC) in order to establish a business on simple food processing. Primarily the NGOs should carry out this MF. It is recommended that the first step which requires a little amount of fund will be started by BIDANI, and then transfer the donor to CAVALCO after each member loan exceeds to 15,000 pesos that resulted from the good achievement in loan payment by the organization.

When the accumulative CBU exceeds 500,000 pesos that will probably occur in Medium Term Development period, MPCI should register to GPC as a cooperative member. By doing so, the cooperative can expect diversified loan sources, and consequently, it can form a financially strong body toward emergency. Further, the MPCI should harmonize with other cooperatives that will be newly established in different Barangays in the same Cluster. In the long run, MPCI should form a financial network, which will cover the whole area of the Cluster under the framework of GPC scheme.

5.6.2 Livelihood Development Plan

Livelihood development plan in this Cluster includes backyard gardening, fish culture, mushroom culture and simple food processing. Considering it is required to improve home economy as soon as possible, these projects will be put into practice in the first (1st) year of the Short Term Plan period. The backyard gardening will be disseminated to women in the Cluster. The proposed demonstration farm shall be established one (1) each at a Purok and to be given with practical training by an extension workers. The skills learned will be disseminated to other farmers. The extension workers will provide seed for demonstration purposes. The project will be carried out in the first three (3) years.

[2] Business consultant proposed in the Master Plan will be assigned for technical support.

Fish culture will be led by NGO. Agricultural extension workers will judge the land topographically, and fishpond will be constructed with Small Fish Reservoir (SFR) project in the first (1st) year. Fish raising will start in the second year with the fry provided by CVROSFR free for three (3) years. The grower shall purchase the fry by himself after that period. Mushroom culture will be extended to women practically with the skills taught by extension workers. The extension workers shall be trained first at RCPC. This project will be executed from the first (1st) year. The seed fungus will be provided by RCPC for free in the first (1st) year, and the growers shall buy it by themselves later.

Simple food processing will be introduced utilizing locally available materials produced in this Cluster and it will not necessarily need equipment and facility except those simple ones. It will be operated and managed by women organization as RIC or Green Ladies Club. The proposed products are banana chips, dried mango, dried pineapple, banana vinegar, and pineapple and sugar cane vinegar. This program will start after the social preparation activities are finished and women organization will operate and manage the processing activities. The Provincial Office of the Science and Technology will give technical training and advice to these women organizations.

5.6.3 Management Capability Building Plan

The details of the Plan are shown in 6.3.3 of the Part 1. The objective of this Plan is to increase the management capability of the agencies' staff as well as the farmer beneficiaries through the training for the effective and efficient implementation of the proposed development plans. The training will principally be conducted at the municipality level. The target agencies' staffs are the DARPO's staff, government officials of line agencies and LGUs, NGO staff and so on. The target farmer beneficiaries are mainly barangay officials. All the training programs will be implemented within two (2) years after the commencement of the project implementation. The impact survey at the end of the second (2nd) year will review and determine if the training programs need to be continued.

The training programs included in the Plan are: (1) Development Planning, (2) Planning Workshop cum Training, (3) Monitoring and Evaluation, (4) Training to Trainers and (5) Project Management (Social Preparation)

5.7 Implementation Plan

As shown in 6.8.3 " in Part 1 of this report, the first development priority will given to "Management Capability Building Plan", "Farmers' Organization Strengthening Plan" and "Rural Credit Plan" to improve farmer's and MPCI's management capabilities. Therefore, they should be started before all others plans. "Livelihood Development Plan" will be carried out for individual farmers. Although this will directly contribute to the improvement of living standard of the farmers, there have been several similar projects and there seems no need of specific new instruction and training. These four (4) plans will start at the first (1st) year in the short-term development period.

"Management Capability Building Plan" will be carried out for two (2) years in the short term development period. As the management capability building of the LGU and promotion of agricultural

technology to agricultural extension workers will be achieved in the first year. The components managed by Barangay, such as multi purpose solar dryer (including multi-purpose pavement) in the framework of "Prost Harvest Facility Development Plan", "FTMR development" and "Agriculture Development Plan" will follow. "Agriculture development" is to be undertaken with the assistance of DA. The construction of the multi purpose dryer will be promoted with the assistance of LGU who will supply materials, labors and construction machines. Through the process of construction and supervision, the farmers of the Barangay will themselves improve their technology, management and maintenance skill. Considering this, the works will be carried out for the long period. After the improvement of capabilities of LGU, LGUs or the Barangay will carry out FTMR Development on the contract basis. The work will start in the second (2^{nd}) year like that of the multi purpose dryer.

The MPCI will be in charge of the management and maintenance of the warehouse as well as its construction. In consideration of this, the construction of the warehouse will start at a time when the MPCI is prepared to take up the work, and the CBU has come up to more than 200,000 peso (5th year from the beginning of the short-term development program).

The implementation schedule of each component for the San Manuel ARC is shown in Figure 5.7.1.

5.8 Operation and Maintenance Plan

The multi purpose solar dryer under the Barangay management shall be maintained through the rental charges that will be collected from the users. Barangay will decide the amount of the rental charge. They shall be kept in "Special Account of Solar Dryer" and used shall be utilized for the repair of the facility as necessary.

The management and maintenance of the warehouse shall be managed and maintained by the MPCI. The surplus of MPCI will be used for O&M cost of the warehouse.

LGU will be in charge of the management and maintenance of the roads, and beneficiaries of the farm road shall be responsible for the expenses of fuel for a machine, supply of labor and snack under the existing rule of LGU.

5.9 Project Cost

The unit costs/prices are determined considering the recent projects executed by the line agencies and NGOs in June 2000. Exchange rate based on the average rate for three (3) months from March to May 2000 are applied for this estimate.

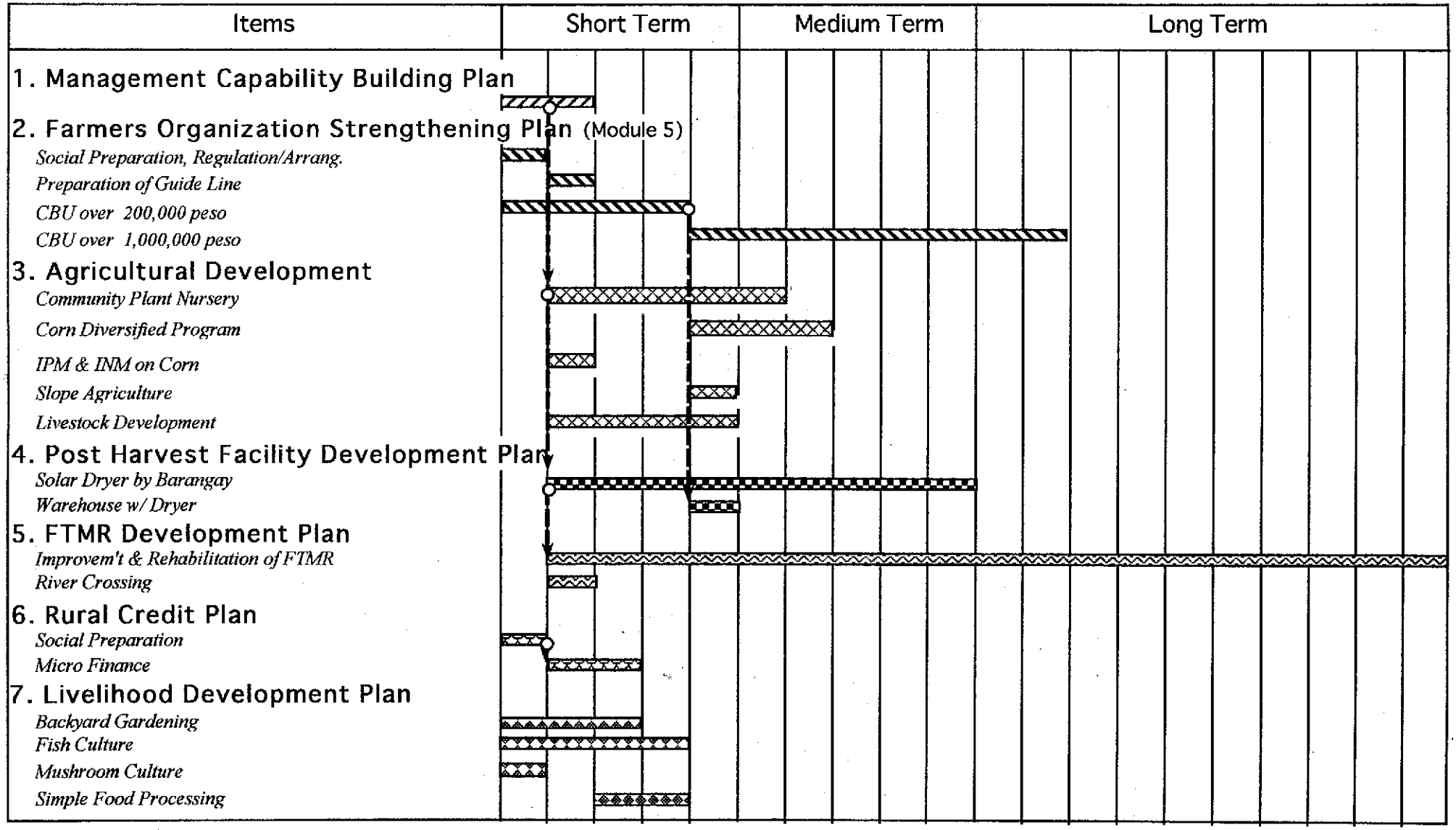
1.0 US$ = 42.0 pesos = 106.0 yen
For cost estimate, the following assumptions are applied:

Administration Cost:	8 % of direct construction cost
Physical Contingency:	10 % of costs such as direct construction cost,

Figure 5-7-1

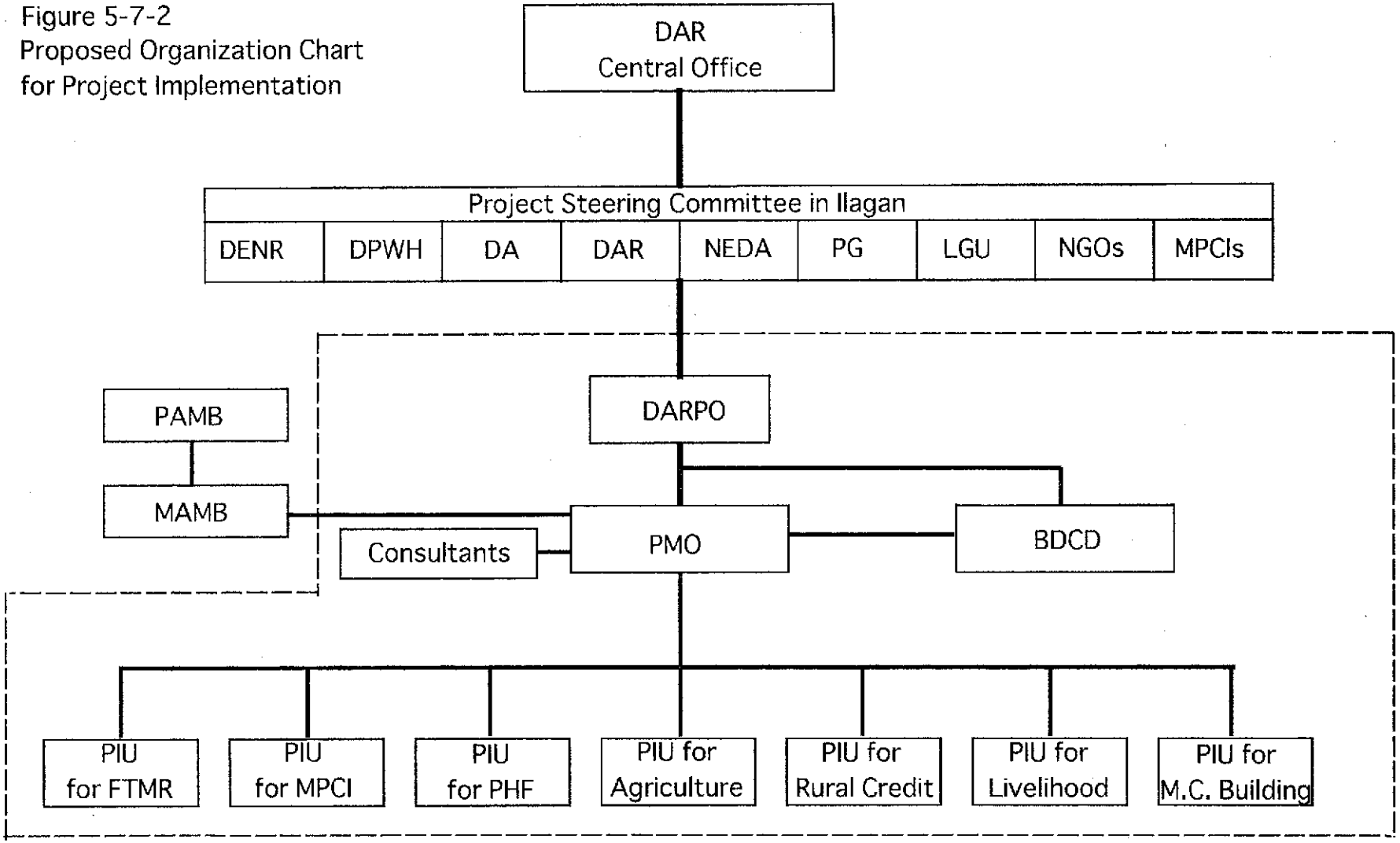
Tentative Implementation Schedule
(La Suerte Cluster In Isabela Settlement)

F O: Vibrant ⬆



Source: JICA Study Team

Figure 5-7-2
Proposed Organization Chart
for Project Implementation



Note: PMO - Project Management Office
PIU - Project Implementation Unit
PHF - Post Harvest Facilities
FTMR - Farm to Market Road
MAMB - Municipal Agrarian Reform Management Board
PAMB - Provincial Agrarian Reform Management Board
M.C.Building - Management Capability Building
MPCI - Multi-Purpose Cooperative Inc.
BDCD - Beneficiaries Development and Coordination Division
DARPO - Department of Agrarian Reform Provincial Office

For estimate of price contingency, the annual price escalation rate of 2.0 % for the foreign currency portion is used based on an average rate for advanced five (5) countries. The annual price escalation rate of 9.4 % for the local currency portion used is based on the average rate for one (1) year from July 1998 to June 1999.

The total project cost amounted to 241 million pesos. The necessary project costs by short, medium and long term development period are 173 million, 30 million and 38 million pesos, respectively. (refer to Table 5-9-1)

The operation and maintenance costs consist of fuel costs and electricity of facilities, repair cost of the offices and labor cost, O&M and general management costs. For physical contingency, the assumption applied is 10 %.

The necessary operation and maintenance costs by short, medium and long-term development period are 70 thousand, 630 thousand and 1,470 thousand pesos, respectively. (refer to Table 5-9-2)

5.10 Project Evaluation

5.10.1 Farm Budget Analysis

Double cropping of rice and corn in both wet and dry season is the major crop production at the La Suerte Cluster. The farm budget analysis of these major crops is shown in Tables J-70A to J-73A in Appendix J. Fruits including banana, pineapple, coconut, mango, calamansi and avogado constitute most of other crop produced at La Suerte Cluster. Planting of Gmelina and mahogany is suggested to keep the environment friendly to other crop production. Only field crop found produced in a significant scale at La Suerte is cassava. Backyard livestock raising include cattle and hog fattening and poultry raising. The farm budget analysis of selected minor crops and backyard livestock raising are shown in Tables J-4A to J-29A in Appendix J.

The net production values (NPV) of most annual crops (rice, corn, beans, vegetable) produced at La Suerte are positive. Except banana, other fruits with high investment in the first year and zero earning in the following four (4) to six (6) years give negative NPV for all the fruit-free years and positive later on. The NPVs of hog and poultry raising, which require high investment in the first (1st) year, also give negative NPV in the first (1st) year and positive NPV later on.

5.10.2 Project Evaluation

(1) Financial Analysis

The financial analysis of the La Suerte Cluster is based on the same set of assumptions given earlier. The financial analysis of the La Suerte ARC indicates the highest FIRR among all the five (5) Model ARCs of 49 % for the Low case and higher than 50 % for the High case. Their Net Present

Table 5-9-1 Project Cost

unit : '000 pesos

Development Plan	Quantities	Short Term			Medium Term			Long Term			Total		
		LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Agriculture Development Plan		159	0	159	7	0	7	0	0	0	166	0	166
1.1 IPM &INM Training	1 L.S	17	0	17	0	0	0	0	0	0	17	0	17
1.2 Sloping agriculture	1 L.S	3	0	3	0	0	0	0	0	0	3	0	3
1.3 Community plant nursery	1 L.S	129	0	129	5	0	5	0	0	0	134	0	134
1.4 Crop diversification (perennials)	1 L.S	2	0	2	2	0	2	0	0	0	4	0	4
1.5 Livestock development	1 L.S	8	0	8	0	0	0	0	0	0	8	0	8
2. Irrigation Development Plan	0 ha	0	0	0	0	0	0	0	0	0	0	0	0
3. Post-Harvest Development Plan		5,990	3,720	9,710	2,296	1,585	3,881	4,591	3,170	7,761	12,877	8,475	21,352
3.1 Solar Dryer by Barangay (1)	5,302 sq.m	2,296	1,585	3,881	0	0	0	0	0	0	2,296	1,585	3,881
3.2 Solar Dryer by Barangay (2)	5,302 sq.m	0	0	0	2,296	1,585	3,881	0	0	0	2,296	1,585	3,881
3.3 Solar Dryer by Barangay (3)	10,602 sq.m	0	0	0	0	0	0	4,591	3,170	7,761	4,591	3,170	7,761
3.4 Solar Dryer by Cooperative	5,835 sq.m	2,527	1,744	4,271	0	0	0	0	0	0	2,527	1,744	4,271
3.5 Mechanical Dryer	70 cavan	367	41	408	0	0	0	0	0	0	367	41	408
3.6 Warehouse	500 sq.m	800	350	1,150	0	0	0	0	0	0	800	350	1,150
4. Farm-to-Market Road Development Plan		17,898	-7,270	10,628	0	7,322	7,322	0	0	0	17,898	52	17,950
4.1 Re-Const. of La Suerte - Buenavista	4.4 km	2,983	4,211	7,194	0	0	0	0	0	0	2,983	4,211	7,194
4.2 - do - Bridge	1 Unit	2,983	-1,156	1,827	0	0	0	0	0	0	2,983	-1,156	1,827
4.3 Re-Const. of La Suerte - Lunac	1.0 km	2,983	-2,090	893	0	0	0	0	0	0	2,983	-2,090	893
4.4 Re-Const. of Buenavista - Victory	0.8 km	2,983	-2,269	714	0	0	0	0	0	0	2,983	-2,269	714
4.5 Re-Const. of Buenavista - San Marcelo	4.8 km	2,983	-2,983	0	0	4,286	4,286	0	0	0	2,983	1,303	4,286
4.6 Re-Const. of San Vicente - Macalauat	3.4 km	2,983	-2,983	0	0	3,036	3,036	0	0	0	2,983	53	3,036
5. Farmers' Organization Development Plan	1 L.S	629	167	796	122	3	125	0	0	0	751	170	921
6. Rural Credit Plan	1 L.S	0	0	0	885	707	1,592	1,884	1,012	2,896	2,769	1,719	4,488
7. Livelihood Development Plan		102	0	102	0	0	0	0	0	0	102	0	102
5.1 Backyard gardening	1 L.S	7	0	7	0	0	0	0	0	0	7	0	7
5.2 Fish culture	1 L.S	28	0	28	0	0	0	0	0	0	28	0	28
5.3 Mushroom culture	1 L.S	4	0	4	0	0	0	0	0	0	4	0	4
5.4 Simple food processing	1 L.S	63	0	63	0	0	0	0	0	0	63	0	63
8. Management Capability Building Plan	1 L.S	162	396	558	10	40	50	0	0	0	172	436	608
9. Operation and Maintenance Equipment	1 L.S	7,887	62,184	70,071	0	0	0	0	0	0	7,887	62,184	70,071
10. Consultant Service Fee	1 L.S	10,071	23,947	34,018	887	2,922	3,809	0	0	0	10,958	26,869	37,827
Sub-Total		42,898	83,144	126,042	4,207	12,579	16,786	6,475	4,182	10,657	53,580	99,905	153,485
Administration Cost (8%)		2,372	7,711	10,083	577	766	1,343	516	336	852	3,465	8,813	12,278
Sub-Total		45,270	90,855	136,125	4,784	13,345	18,129	6,991	4,518	11,509	57,045	108,718	165,763
Physical Contingencies (10%)		3,203	10,410	13,613	780	1,033	1,813	701	450	1,151	4,684	11,893	16,577
Sub-Total		48,473	101,265	149,738	5,564	14,378	19,942	7,692	4,968	12,660	61,729	120,611	182,340
Price Escalation		13,881	9,119	23,000	8,714	1,750	10,464	24,016	1,750	25,766	46,611	12,619	59,230
TOTAL		62,354	110,384	172,738	14,278	16,128	30,406	31,708	6,718	38,426	108,340	133,230	241,570

Table 5-9-2 Operation and Maintenance Costs

unit : '000 pesos

Development Plan	Short Term			Medium Term			Long Term			Total		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Irrigation Development Plan	0	0	0	0	0	0	0	0	0	0	0	0
2. Farmers' Organization Development Plan	15	0	15	3	0	3	0	0	0	18	0	18
3. Rural Credit Plan	0	0	0	319	0	319	638	0	638	957	0	957
4.Others	52	0	52	252	0	252	699	0	699	1,003	0	1,003
Sub-Total	67	0	67	574	0	574	1,337	0	1,337	1,978	0	1,978
Physical Contingencies (10%)	6	0	6	58	0	58	134	0	134	198	0	198
TOTAL	73	0	73	632	0	632	1,471	0	1,471	2,176	0	2,176

Worth at 15 % opportunity cost of capital are 126.26 and 195.55 million pesos, respectively.

The sensitivity analysis of the Low case FIRR indicate a 39 % resistance to reduced benefit and higher than 50 % to increases in both production and project costs. Those for the high case endure more than 50 % for all the changes.

(2) Economic Evaluation

Economically, there are two ways of deriving the Economic Internal Rate of Return (EIRR) of a project. One is to apply the Standard Conversion Factors (SCF) to the financial prices of all inputs and outputs used in the analysis. The other is through applying the Shadow Exchange Rate (SER). Algebraically, the relation between the SCF, SER, the Official Exchange Rate (OER) and the Foreign Exchange Premium (FX) are as follows:

SER = OER x (1 + FX premium) = OER/SCF
SCF = 1/(1 + FX premium) = OER/SER

While SCFs are generally used for an internationally financed project, the requirement of the NEDA/ICC is that the SERs be used in deriving the EIRR to any project submitted for its consideration. The suggested values of the two are currently given by NEDA are given below;

Variables	International Standard	NEDA/ICC
1. Foreign exchange rate	OER	Shadow exchange rate
2. Conversion factors	SCF	SER
3. Tradable items	SCF = 1.0	SER= 1.2
4. Non-tradable items	SCF = 0.8	SER= 1.0
5. Unskilled labor	SCF = 0.6	SER= 0.6

The two major food grains in the La Suerte Cluster, namely, rice and corn, are regarded as tradable items in the economic analysis of this report.

Apart from the EIRR calculated on the basis of the SER, another sets of EIRR calculated based on the SCF are as follows. In general, the EIRRs derived from the two factors are very close. Possible deviations from each other are due to the different proportion of the tradable and non-tradable inputs applied and output produced. (refer to Table J-79C in Appendix J)

Results of EIRR Calculation (%)

Case	La Suerte Cluster	
	w/ SER	w/ SCF
Low	41	43
High	63	69

5.10.3 Financial Viability of Implementing Agencies

The financial viability of the Angadanan Municipality, where the La Suerte Cluster belongs, in terms of its Net Loanable Allowance (NLA) is shown in Table J-79A in Appendix J. It is higher than the proposed project development costs in every year. This gives the green light to the proposed development at the La Suerter Cluster.

5.10.4. Initial Environmental Examination (IEE)

The proposed ARC development plan consists of the agriculture development, post-harvest development, farm-to-market road development, farmers' organization development, rural credit and livelihood development plans and management capability building. The development plans are covered by the environmental checklist. (refer to Table 5-10-1)

These development plans will not have serious impact on the present environment condition, because the development plans proposed are small in scale. Consequently, Environmental Impact Assessment (EIA) is not necessary. The impacts of the proposed ARC development plans are presented as follows:

(On Socio-Economic Environment)

- Income gap is observed between developed and undeveloped ARCs. However, the proposed development plans when implemented will reduce the gap.
- Existing system/custom and social structures will gradually be changed by the farmer's organization development plan. However, since the development plan will only strengthen the existing multi purpose cooperatives, the impact may not be extensive.

If the existing farming practices will continue, it will have a negative impact on the existing environment. The following environmental conservation measures will be considered in the implementation of the proposed development plans:

- Extension of Integrated Pest Management (IPM) to decrease utilization of chemicals and pesticides.
- Conversion of perennials crops from existing crops where soil erosion occurs to stabilize farm management and prevent soil erosion.

Table 5-10-1 Environmental Checklist

Activities of Construction / Environmental Issues	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organaization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
I. Socio-economic Environment													
1. Social Life													
(1) Living													
- Planned resettlement													
- Non-spontaneous resettlement		C	C	C	C	C	C	C	C				
- Change in life style	C	C	C	C	C	C	C	C	C	C	C	C	
- Friction among inhabitants	C	C	C	C	C	C	C	C	C	C	C	C	
- Indigenous people / Minority / Nomad													
(2) Population													
- Population increase													
- Sudden change in population composition													
(3) Economic activities													
- Shift of economic activity base	C	C	C	C	C	C	C	C	C	C	C	C	
- Shift in / economic activities unemployment	C	C	C	C	C	C	C	C	C	C	C	C	
- Expansion of economic gap	B	C	C	C	C	C	C	C	C	B	B	B	
(4) Institution / Custom													
- Resettlement of water right / fishery right		B	B									C	
- Change in social structure (e.g. organization)	C	C	C	C	C	C	C	C	C	B		C	
- Restructuring of existing system / custom	C	C	C	C	C	C	C	C	C	B		C	
2. Health / Sanitation													
- Increase in pesticide use	C											C	
- Outbreak of endemic disease	C	C	C	C	C	C	C	C	C			C	
- Spread of infectious illness	C	C	C	C	C	C	C	C	C			C	
- Accumulation of residual toxic (e.g. pesticides)													
- Increase in waste / excrement													
3. Historic spot / Cultural heritage / Scenery													
- Damage and destruction of historic spot / cultural heritage		C	C	C	C	C	C	C	C				
- Loss in important landscape or scenery	C	C	C	C	C	C	C	C	C			C	
- Impact to buried cultural assets		C	C	C	C	C	C	C	C				

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear

▨: not applicable

(Continue)

Table 5-10-1 (Continued)

Activities of Construction / Environmental Items	1. Agriculture Development Plan	2. Irrigation Development Plan		3. Post-harvest Development Plan			4. Farm-to-market Road Development Plan			5. Farmers' Organaization Development Plan	6. Rural Credit Plan	7. Livelihood Development Plan	8. Management Capability Building Plan
		Construction of pumping stations	Canalization (rehabilitation and construction)	Construction of solar dryer	Provision of mechanical dryer	Construction of warehouse	Construction of FTMR	Construction bridges	Rehabilitation of roads				
II. Natural Environment													
4. Valuable life / ecological area													
- Change in vegetation	C	C	C	C	C	C	C	C	C			C	
- Impact to scarce or specific animal or plant species													
- Diversity of species	C	C	C	C	C	C	C	C	C			C	
- Penetration / Propagation of a harmful life	C	C	C				C	C	C			C	
- Extinction of wetland / peat bog													
- Extinction of tropical forest / wild land													
- Destruction of mangrove forest													
- Destruction of coral reef													
5. Soil / Land													
(1) Soil													
- Soil erosion	C											C	
- Salinization of soil	C											C	
- Fall in soil fertility	C											C	
- Soil contamination	C	C	C				C	C	C			C	
(2) Land													
- Land degradation (including desertification)	C	C	C				C	C	C			C	
- Hinterland degradation	C	C	C				C	C	C			C	
- Land subsidence	C	C	C	C	C	C	C	C	C			C	
6. Hydrology / Water quality													
(1) Hydrology													
- Change in surface runoff	C	C	C	C	C	C	C	C	C			C	
- Change in groundwater runoff / level	C	C	C	C	C	C	C	C	C			C	
- Inundation / Flood	C	C	C	C			C	C	C			C	
- Soil deposit	C	C	C				C	C	C			C	
- Fall in riverbed													
- Shipping													
(2) Water quality / Water temperature													
- Water pollution / degradation	C	C	C	C	C	C	C	C	C			C	
- Eutrophication	C	C	C	C	C	C	C	C	C			C	
- Change in salt-water													
- Change in water temperature	C	C	C	C	C	C	C	C	C			C	
(3) The air													
- Air pollution	C	C	C	C	C	C	C	C	C			C	

note ; A) major impact, B) small impact, C) expected that serious impact will not occur, or not clear
▨ : not applicable