3.9.4. Communication

Telecommunication and postal communication facilities contribute to saving of time and travel cost. The following are the existing services at present.

1) Telecommunication

a) Radio telegraph station

There are 24 stations located at 21 municipalities and three in the Calbayog city. However, five municipalities still do not have telecommunication facilities.

b) Telegraph transfer station

Catbalogan and the Calbayog city have National Telegraphic Transfer Services (NTTS), radio telegraph and telex facilities for only domestic coverage.

c) Telephone exchange

BUTEL has 300 lines capacity of telephone exchange within the limited area coverage of the town area of Catbalogan. Likewise, the Calbayog city has 300 lines capacity operated by a private company.

d) Long distance telephone services

RCPI and PLDT of private companies have long distance services to Manila and Cebu with limited lines in Catbalogan and the Calbayog city, respectively.

2) Postal Communication

a) Organization

The organization of postal communication in Region VIII is composed of a regional office in Tacloban, nine district offices, 142 post offices and 58 postal stations in 1986. The Samar province has a district office in Catbalogan.

b) Number of post offices and postal stations

There are 25 post offices and 14 postal stations in the Samar province.

c) Personnel

In the Samar province 159 personnel are allocated. The letter carrier to population ratios were 1:3,258 in the Samar province and 1:8,124 in the Calbayog city, respectively, as against the standard ratio of 1:5,000.

d) Operation

The project mercury (daily) service from Tacloban is operated to the Calbayog city through Catbalogan, and Basey. According to the test letter result by Bureau of Post in Tacloban, the average elapsed times are 3.03 days both inter-regional and inter-regional test letters. In case of inter-regional letter, the standard range of delivery is from one to five days.

3) Development problem

The followings are pointed out as problems at present.

a) Telecommunication

- No radio station: San Jorge, San Jose de Buan, San Sebastian and Tagapulan
- Land-line based telegraph facilities: Jiabong, Wright, Hinabangan, Calbiga, Pinabacdao, Vilareal, Oquendo Tinanbacan and Sta. Margarita.
- Many rented offices
- Low service level of telephone

b) Postal communication

- No post office: San Jose de Buan and Matuginao (closed)
- Many rented offices
- Shortage of mail vehicle
- Shortage of personnel for the Calbayog city

3.10. Development Problems and Constraints

3.10.1. Physical Problems and Constraints

The natural conditions of the development in the Samar province, especially its land and water resources are the subjects which require the advanced technology to realize the maximum utilization of the resources.

Notwithstanding the existence of abundant water resources, the location of the river and the quality of water require the strict study of water availability in objective points as well as geology.

Slope land conditions also oblige to study on the possibility of vertical utilization of land for agriculture and on level-up of appropriate technology for land use. Natural calamities like typhoons are observed as constraints that cannot be controlled by general means. The response to these calamities take the form to minimize the risk, for example, the construction of flood control system.

3.10.2. Economic Problems and Constraints

The economic problems and constraints which hinder the development of the province shall be classified mainly into the following four categories.

1) Low productivity and small production

Agricultural production is not sufficient for their self-sustenance and productivity per capita and/or per hectare is far lower than the average in the Philippines (refer to Section 3.3.2). Aside from agriculture, all the other industries could hardly have a high productivity due to a lack of scale merit of production and to the limited market. However, it might be possible to level up the productivity to the national average through transfer of appropriate technology.

2) Lack of capital (Financial constraints)

Because of limited incentive for private investment, development projects as well as installation of infrastructure have been inevitably dependent on public funds, especially central government fund allocation. Even though the Samar province has

received 68 pesos of allotment per capita from central government budget in 1984; a comparatively large share compared with those of other provinces in Region VIII, the shortage of fund has been considered as a main obstacle for implementation of development projects.

Furthermore, the central government allotment in 1985 shows its orientation for the social services like education and medical services. (refer to Appendix B.1.4)

Hence, in agricultural sector, farmers could not obtain the necessary equipment and/or working animal and utilize the required material like fertilizer and pesticide due to lack of fund. Likewise, the survey on the small scale and cottage industries conducted by DTI shows the shortage of working and investment capital as main obstacle for their management. (refer to section 3.4.1)

On the other hand, every kind of infrastructure for production and social welfare for laborer has not reached to the required level; say the average of the Philippines due to first of all lack of required fund.

3) Lack of market and marketing facilities

Small amount of production forms the cause and the result of lack of internal market in the island due to the small purchasing power on the consumer side.

For exporting the produce of the Samar province to other provinces and to foreign countries, on the other hand, every kind of marketing facilities like transportation, storage and collection system of goods has not been sufficient, which means that the market channel has not been established.

4) Lack of appropriate technology

This element is closely concerned with social problems and constraints of skilled man-power. However, the problems are found in the non-existence or the insufficiency of technology itself in the province. Without accumulating the technical know-how by operating actually any kind of industry, it is hard to transfer the appropriate and improved technology.

3.10.3. Social Problems and Constraints

1) Population and employment

There has been a high degree of out-migration in the Samar province due to lack of sufficient jobs and the difficult living condition. Consequently, there is a shortage of skilled labor; vice-versa, without the skilled labor, there is no inducement for the development of industries. Low growth of employment opportunity has caused considerable unemployment and underemployment in the province; hence the low income.

2) Health conditions

Among social welfare constraints, there exists a serious problem of health care; one specific case is the disease of schistosomiasis. Several trial attempts have been made to eradicate the disease, but it has still remained as serious disease which hinders the people's normal living condition.

3) Infrastructure

Poor infrastructure conditions are the main causes of the obstacles for the inhabitants to vitalize their economic activities. The present conditions of each infrastructure as well as their problems and future improvement programs are described in

corresponding chapters. At the same time, the inhabitants' opinions vis-a-vis, the improvement of infrastructure as well as living conditions are analyzed and summarized in Section 3.11.

3.11. Inquiry Survey of Inhabitants' Needs

With the purpose of knowing the inhabitants' opinions for the betterment of their living conditions, an inquiry survey was conducted in the Samar province and the results were summarized as follows. (refer to Appendix B.5.1)

3.11.1. Analysis on Preference for Projects

1) Analysis

- Tabulation result came up with the following ranking

  Rank I - Road Linkage - 222 points
  Rank II - Water Supply - 218
  Rank III - Education - 162
  Rank IV - Agriculture/Farmland - 130

  By using the reasonable converting points, the result of ranking cannot be changed.

- If ranking is based on the 18 categories

  Rank III - Agriculture - 117 points
  Rank IV - Elementary Education - 93

- After the first three priority projects (Items), next ranking obtained are:

  Rank V - Means of Transportation - 84 points
  Rank VI - Health Care - 67
  Rank VII - Levelling Up Income - 54

- Among each category of projects preferable items chosen by the respondents are briefly as follows:

  On Education;
  Option 1 ... educational facilities
  Option 2 ... institution for primary to high school
  Option 3 ... institution for colleges and vocational courses

On Agriculture Facilities
Option 1 ... irrigation
Option 2 ... inputs like fertilizer and pesticide
Option 3 ... drainage

On Increase of Employment
Option 1 ... agriculture
Option 2 ... public financial services
Option 3 ... fisheries

2) Observation

The above results showed that inhabitants are primarily interested in items that would improve their living condition and secondly in those that would contribute to their productivity. However, inquiry made more in detail showed their option for irrigation facilities and agricultural development. In a certain municipality, on the other hand, Barangay's preference of projects sometimes was different from the other Barangay because of the difference in their existing living condition. Therefore, it would be hardly concluded that all Barangay in a certain municipality request for a specific project unanimously.

3.11.2. Analysis and Observation on Each Item

1) First category of projects (Rank I - IV) (refer to Appendix B.5.2)

a) Road linkage

The item is a matter of concern of all the inhabitants and is ranked first as to their preference but the response showed some variation. The inhabitants of Barangay where there is no access road from the National Road expect earnestly to have the municipal road. On the other hand, the inhabitants of the Barangay located along or near the Maharlika Highway show the preference for other items. Nevertheless, they showed their unanimous expectations that Barangay road would be constructed or improved into asphalt or concrete roads.

b) Potable water system

The item is requested by a large number of inhabitants to be improved. In most of the towns, the water system needs renovation or immediate rehabilitation. Likewise, the Barangay surveyed are suffering from non-availability of drinking water even with the existing springs and wells.

Even though the inhabitants showed that water supply is necessary and highly expected, they do not see it as being realized immediately. Such attitude could be attributed to their sad experiences in the past wherein water supply projects are neither satisfactorily completed nor are functional.

c) Farmland and agriculture facilities

Regarding farmland, even under the situation where Agrarian Reform is taking step, the inhabitants did not show great interest in the increase of their farmland, say, "twofold". Their preference is observed to be more on the construction of farm roads.

As for agriculture facilities, many farmers who are engaged in rainfed agriculture expect for the installation of irrigation and drainage facilities and suffer of shortage of agricultural inputs. The farmers also showed interest in multi-cropping as may be suited for their farm. As for the farm mechanization even though they expect it, they prefer at present to working animals such as carabao for their practice in the farm.

d) Education

Inhabitants suffer from lack of education facilities such as school buildings and supply of materials, tools and other equipment for education. Likewise, there are insufficient number of teachers.

Many Barangays have no high school and only a small percentage of children could go to high school in Catbalogan or the Calbayog city due to various reasons; most of their parents could not afford a high education for their children because of a very low income, and also because many Barangays have no accessible road to Catbalogan or the Calbayog city.

2) Second category of projects (Rank V-VII)

a) Road transportation

Some of the inhabitants located along the Maharlika Highway showed lesser interest of having improved public transportation

facilities by answering "satisfied" to this item. However, most of the inhabitants hope to have more public transportation facilities and those in areas accessible only by boat earnestly expect road construction and transportation.

Compared with the road transportation, the item of other transportations did not get much attention from the inhabitants. They preferred road transportation to river transportation because of security and required time. Some of them chose sea transportation and only a small percentage showed interest in the augmentation of airport facilities.

b) Health care

The inhabitants showed a great interest in the item due to lack of health care facilities and services. Many Barangays have no health centers. Some Barangays have health centers but their facilities and manpower are inadequate; only one nurse and the doctor not always around.

In areas where there is a higher prevalence rate of the schistosomiasis, inhabitants highly expect for the solution of this problem and for more medicines to cure those infected.

On the contrary, as to the leveling up of population growth or life span as a result of good health care, the inhabitants are less interested in it because they consider the present population is a reasonable magnitude.

c) Income and employment opportunities

To level up income is a subject of concern of almost all of the inhabitants whose income is not sufficient. They want to have more and better jobs for higher income. However, the prospect of the inhabitants as to leveling up their income seems uncertain because they could not identify the means or solution.

The inhabitants expressed their interest in obtaining constant jobs/working opportunity. However, as to the social insurance system for unemployment, they could not expect it.

Some inhabitants prefer agriculture-related jobs, others hope to develop many kinds of industries. Some farmers also prefer fishing while some fisherman prefer agriculture due to the recent calamity of red tide.

These uncertain prospects on income and employment seemingly have brought the result of lower ranking of these items notwithstanding their earnest wishes.

3) Third category (Lower ranks)

Most houses in the rural area are made of nipa roofs and bamboo or wooden walls which are not strong enough to withstand typhoon. The background information survey shows that only 12% of the respondents have houses made of other materials such as cement. Notwithstanding the above fact; though the inhabitants consider it necessary, they do not show much interest in improving their housing condition.

Most of the inhabitants, except those who are engaged in business, do not consider communication facilities such as telecommunication, TV and telephone as important because of lack of market mechanism although they find it necessary. But there might arise some change in their opinion in the near future.

Under the condition of electrification ratio of 21% in 1985 by SAMELCOs I & II, three sorts of responses were obtained as enumerated below;

- Those who have no electricity and expect much for electrification.
- Those who have electricity but wish to have sufficient supply or improvement because they suffer from brown outs and/or shortage of it.
- Those who have electricity and are satisfied to some extent with the present condition.

In addition to the above, the respondents commonly wish that electric rates would be reduced. The inhabitants are unsatisfied with to their chance of obtaining shopping items desirable. However, they showed less interest in the subject, because they consider these articles are not indispensable in their daily life. The farmers prefer to obtain a tractor, but many respondents showed their wishes for a refrigerator.

CHAPTER 4. DEVELOPMENT PROGRAMS AND PROJECTS

CHAPTER 4. DEVELOPMENT PROGRAMS

4.1. Overview of Regional Development Plans

4.1.1. Overview of Three Regional Development Plans

1) Comparison of plans

A study of past development plans vis-a-vis the present plan shall establish the trend in Regional Development.

The objectives of reducing the poverty and increasing the productivity and employment opportunities as well as improving the infrastructure and social welfare has been common to all development plans. However, only slight differences in objectives and targets are observed. In terms of objectives, the latest plan mentioned the objective of reducing the dependence on traditional agricultural crops but did not include the strengthening of administration capability. In terms of targets, there has been a slight variation in targeted economic growth rates (9.2% for 1978-1982, 5.4% for 1984-1987 and 7.7% for 1988-1992).

Agriculture has been a common concern in the three development plans. However, there is a trend on increasing share of industry and services in the latest plan which was not considered in the 1978-1982 plan. (refer to Appendix B.2.1)

2) Targets of development

The procedure of formulating a plan is described in Section 3.2.3. It can be noticed that the objectives of these development plans have anticipated or raised with their various expressions, an integrated balanced growth accompanied with three essential targets; high economic growth, equal distribution of benefit, and level up of social welfare which are traditionally common to almost all development plans.

3) Strategies and policy framework

To realize the target, policy frameworks and strategies have been established for Region VIII so as to guide the formulation of programs and projects. These policy framework and strategies are well described in the Eastern Visayas Regional Development Plan 1987-1992.

4.1.2. Review of Development Objectives in the Samar Province

1) RDIP of Samar province

In addition to the policy of regional development plan of Region VIII reviewed in 4.1.1, it is indispensable to review also the objectives of development in the Samar province by its Regional Development Investment Program (RDIP). Total amount of public investment for five years is programmed about 610 million pesos, in which infrastructure occupies 54% and agriculture three percent. But natural resource conservation with ten percent share could be classified into agriculture sector by another interpretation. Among the investments in the infrastructure, a comparative large portion is occupied by the infrastructure for agriculture like irrigation. Furthermore, it is observed that in agriculture, the on-going project with budgetal allocation has more portion compared with other sector. (refer to Appendix B.2.2).

2) CEDP of Samar province

Another program of public investment is the Community Employment and Development Program (CEDP) which is aimed at generating immediate employment through the implementation of labor intensive (predominantly rural - based) projects.

CEDP-DPWH allocation for year 1987 for Region VIII is 252 million pesos of which 23.4% (59 million pesos) is allotted for

the Samar province. The RDIP figures shall be used as the subject of analysis since CEDP's estimates are provided for FY 1987 only. (refer to Appendix B.2.2)

3) Comparison with regional and national programs of RDIP

Compared with the sectoral share in the present programs of Region VIII and of the Philippines, some characteristics are observed in the programs of the Samar province as follows;

- All of them are infrastructure-oriented program. In case of the Samar province, social services also occupy a large share of 23.4%.
- Inferior share in electricity and in irrigation of 6.5% and 2.2%, respectively, also lower in agriculture of 2.9% in case of the Samar province.
- Small share accounting for 13% in the Region VIII in terms of population share of 18% for the Samar province.

Needless to say, the infrastructure directly supports agriculture, industries and social services. But the tendency observed in the Samar province could be attributed to the depressed condition of infrastructure facilities and social services together with other causes such as concerned agencies' project finding orientation. (refer to Appendix B.2.2)

4.1.3. Regional Development Model

1) Definition of regional economy

Regarding the definition of "regional (rural) economy", there are three kinds of classification.

a) economic theoretical classification
b) classification by existence of statistical units
c) classification by specific economic policy

Considering the unit of economy of the Samar province at present, it is difficult to apply a) and b) classification since there exists no economic independence nor full set of fundamental economic statistics. Consequently with assumption of existence of some economic policy to this specific depressed area, the Samar province could be considered the subject of regional economic development analysis. (refer to Appendix B.2.3)

2) Structural transformation of regional development

Looking at the realities in the Samar province, it can be observed that the province has non advantageous structure for development. So as to transform from non advantageous structure to advantageous one, the concerned parties responsible for planning will be in charge of raising the development targets from various angles. Those development targets are often composed of three elements briefly explained hereunder. (refer to Appendix B.2.3)

3) Three development targets

Those fundamental targets for development; growth, equality and welfare, have been traditionally considered essential development elements but have trade-off relations among them. To integrate the above three elements with the aim of attaining the balanced growth is the task for the concerned parties, but one should always bear in mind their trade-off relations and the difficulty to pursue the three targets at the same time. (refer to Appendix B.2.3)

4.2. Development Strategies and Targets

4.2.1. Development Strategies

Considering the depressed conditions of the Samar province at present, the following three fundamental overall strategies are settled by the Study Team for the selected time targets.

First : Short-term development (5 years range)
Target ; satisfaction of Basic Human Needs (BHN)
Strategy; level up to the national rural average

Second: Medium-term development (10 years range)
Target ; escape from the poverty
Strategy; level up to the national average

Third : Long-term development (20 years range)
Target ; prosperity of the Samar province
Strategy; level up to the highest average in the Philippines (Greater Manila Zone)

These overall strategies will be applicable as much as possible for each of the sectoral development. (refer to Appendix B.3.1)

4.2.2. Projection on Population, Household, and Labor Force

1) Projection of population

Because of lack of recent population census, it was forced the one made in 1980 to use the projected population number established by this census. Among three projections; low, medium and high growth rate, it is most accurate to take the high growth rate considering that the figure of the total population of the Samar province in 1986 is 539,665, obtained by annual report of Department of Health.

This projection will be used as basic figure for all the sectoral analysis. The difference of these projections could be due to three main factors, birth rate, mortality and out-migration. The figures of these factors which were more disadvantageous before 1980 than those at the latest, have become moderate ones as the consequence, it is justified to take a higher growth rate projection. (refer to Appendix B.3.2)

2) Projection of household number

The number of household is also projected by way of estimating the same growth rate of population. It should be noted that such

estimates do not take into account the change in family structure or marriage age, since these factors are uncertain due to its social characteristics.

3) Projection on labor force

As for the labor force projection, there might be two possible methods of estimation;

- By applying correlation index between population and labor force number and in accordance with the increase of the former, the labor force number can be calculated with the same growth rate.
- By analysis of the evolution of structure of population by age, the future labor force number can be obtained.

The projection by the former is considered as rough estimation and for the second method, there is no fixed ratio in the labor number by male and female.

Hence, the projection on labor force is made on the basis of the projection and growth ratio already established by NCSO.

4.2.3. Growth Target of Economic Factors (refer to Appendix B.3.3)

1) Employment growth target

Based on the projection of labor force and the target of reducing the unemployment and underemployment, the required employment target is obtained. In this case, target of pursuing the present national average level becomes meaningless.

Hence, for Region VIII and the Samar province for that matter, the target is to initially reduce unemployment to 7.0% by 1992 and eventually reduce to the reasonable level of 4.0% in the final stage, year 2007.

Likewise, reducing underemployment ratio is also a fixed target. In case of underemployment, required job number is calculated with the assumption of supplying the job for 20% of the underemployment number.

Growth target of employment is formed in Table 4.1, which shows the job creation of about 10,000 annually. Judging from the ratio of job creation against total labor force, these requirements seem very reasonable.

2) Income and expenditure increase target

As of 1985, the average annual income and expenditure per household in the Samar province are 18,254 pesos and 15,937 pesos, respectively. The target of household income and expenditure is calculated in accordance with the development strategy. (refer to Table 4.1)

At the initial stage, the growth rate could not be expected to be considerable because of insufficiency of every kind of jobs. After attaining a certain level of development, however the growth rate could be accelerated to reach the final target. The large gap of income level existing at present between the depressed area, like the Samar province and the Metro Manila zone is hereby acknowledged. The target of increasing income more than three times during 20 years is ambitious but not realistic. In this case, the target figure shall be fixed at constant price in 1985.

For the above target, it will be required a considerable investment for development, as calculated trial in this report.

In accordance with the increase of income, the expenditure will also be augmented with almost the same rate of income increase. That will revitalize the local economic activities so as to make further development possible. (refer to Appendix B.3.3)

Table 4.1. Growth Targets of Employment and House hold Income & Expenditure

	1985	1987	1992	1997	2002	2007
Projected labor force	342,449	388,616	422,435	453,567	484,323	517,881
Unemployment target ratio (%)	7.4 (1983)	7.4	7.0	6.0	5.0	4.0
Underemployment target ratio (%)	65 (1983)	65	50	40	23/4	12/4
Estimated additional job requirement		41,926	35,502	33,924	41,073	40,340
Annual additional job requirement		-	7,100	6,785	-	8,068
Target, Average household Income (pesos)	18,254	18,621	23,418/1	31,052/2	42,146	57,193/3
(index)	(98)	(100)	(126)	(167)	(226)	(307)
Expenditure (pesos)	15,937	16,257	19,397	26,865	35,951	48,453
(index)	(95)	(100)	(119)	(165)	(221)	(298)
Projection, Household Number	101,157	104,493	111,647	119,263	124,987	132,386
Total household income (million pesos)	1,846	1,946	2,615	3,703	5,268	7,571
Income/labor (pesos)	-	4,844	6,195	8,172	10,890	14,627
(index)	-	(100)	(128)	(169)	(225)	(302)

Note: /1 ... Philippine rural average in 1985 x 1.20 (Due to increase of labor number, target is fixed, with 20 % over)
/2 ... Philippine average in 1985
/3 ... Metro Manila zone average in 1985
/4 ... Figures applied as targets in the Regional Development Plan of Eastern Visaya, NEDA.

Source: JICA Study Team

CHAPTER 5. SECTORAL DEVELOPMENT PROGRAM AND TARGET

CHAPTER 5. SECTORAL DEVELOPMENT PROGRAM AND TARGET

5.1. Proposed Land Use and Soil Conservation Measures

5.1.1. Land Use Plan

1) Planning method

The Samar island has vast land area. But most of lands are mountainous and hilly. Due to the constraints of water resources and social infrastructure such as road network, the potential areas for agricultural development are rather limited. Therefore, the lands should be utilized intensively and efficiently in the potential areas. For long-range successful utilization, the ecologically sound land use should be undertaken.

The general focus is on agriculture, though the agricultural improvement has been marginal for the past decade in the Samar province. The land use plan was made after consideration of land and water resources and socio-economic conditions. The individual development plan of each municipality was also taken into consideration.

The land use planning was made through the following criteria:

- According to the land classification map prepared by BFD, the lands having the slope steeper than 18% (outside of A & D lands) were proposed to be forest reserve.
- Next, the land capability as well as geomorphology, slope and soil condition were considered.
- Furthermore, taking into consideration of present land use and social infrastructure such as road condition, the land use pattern in the Study Area was drawn.

2) Land use pattern

The long-range agricultural development of the Samar province

would be based on a stable agricultural system in upland areas as well as lowland areas. The proposed land use patterns depending on the landforms are schematically shown in Figure 5.1.

a) Croplands

The croplands will be developed on lowlands and upland areas. The cropping intensity on the existing croplands should be increased.

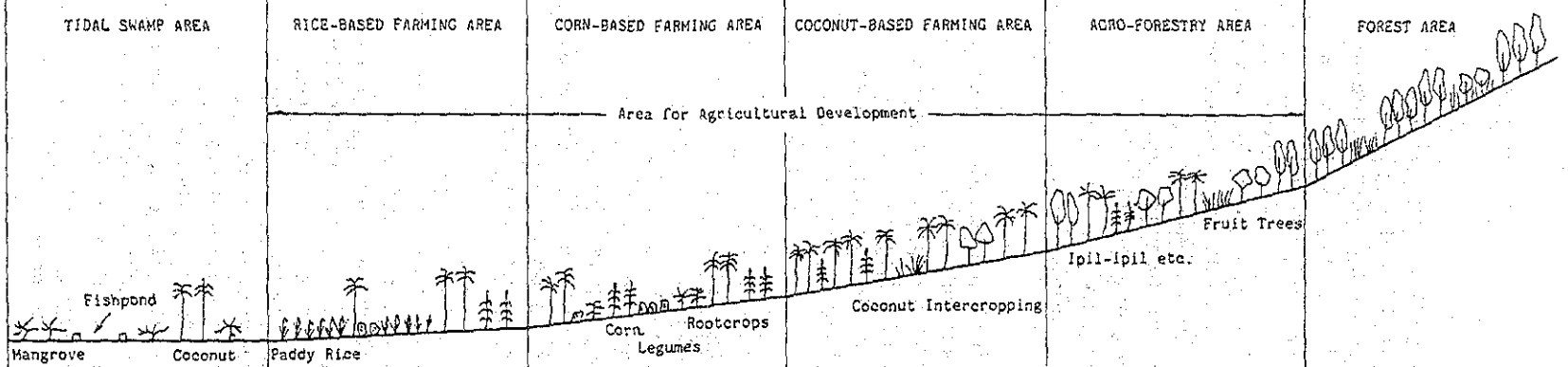
- Most lowland areas are cultivated at present. There is little room for further expansion of cultivation area. Therefore, an emphasis is put on vertical agricultural development, namely, the intensive use of existing cultivation lands. Croplands in the lowland areas will be used for multiple cropping under rice-based farming or corn-based farming.

- Level lands (0 to 3% slope) will be utilized for rice-based farming under either irrigated or rainfed condition. The irrigation facilities will be provided by NIA, FSDC or Water Impounding project. In irrigated rice farms, double cropping of rice or rice-vegetable cropping could be done. Off-season vegetables such as tomatoes could be marketed to Manila profitably. Furthermore, rice-fishculture (Tilapia and carp) will be introduced in the irrigated paddy field. In the rainfed paddy field, Payatak system is presently performed. This system should be gradually improved from a technical point of view. To improve soil fertility, an introduction of Azolla will be effective for such paddy field. Even in the rainfed paddy field, the multiple cropping such as rice-mungbean/peanut and rice-corn will be introduced. Some paddy fields suffering from flooding will be improved by drainage works.

- Gently sloping lands (3 to 8% slope) will be used for corn-based farming under rainfed condition. The lands are utilized intensively as multiple cropping as corn-corn, corn-rootcrops, corn-mungbean/peanut and corn-vegetables as well as coconut intercropping. Some portions will be benefited by water impounding or farm ponds. In addition to incorporating legumes in crop rotation, application of organic fertilizer will be introduced.

- Upland areas are mainly covered by denuded cogonal open lands. The predominant slopes within A & D lands are between 8% and 18%. These areas include major portion of potential lands for horizontal agricultural development, namely, expansion of cultivation lands. These areas are suitable for permanent crops under mixed-cropping with cash crops and will be used for coconut-based farming.

FIGURE 5.1. PROPOSED LAND USE PATTERN



	TIDAL SWAMP AREA	RICE-BASED FARMING AREA	CORN-BASED FARMING AREA	COCONUT-BASED FARMING AREA	AGRO-FORESTRY AREA	FOREST AREA
Area (gross)	148.9 sq.km 2.9 %	183.4 sq.km 3.6 %	289.8 sq.km 5.6 %	591.2 sq.km 11.5 %	866.2 sq.km 16.9 %	3052.5 sq.km 59.5 %
Proposed Land Use	Mangroves/Nipa 80% Fishponds 10% Coconut Trees 10%	Paddy Rice 85% Diversified Crops 10% Coconut Trees 5%	Diversified Crops 60% Coconut Trees 30% Paddy Rice 10%	Coconut Trees 80% Shrubs/Grasses 10% Diversified Crops 5% Fruit Trees 5%	Forests 25% Shrubs/Grasses 25% Coconut Trees 25% Fruit Trees 15% Diversified Crops 10%	Forests 80% Shrubs/Grasses 20%
Predominant Slope	(0%)	(0 - 3%)	(3 - 8%)	(8 - 15%)	(15 - 18%)	(>18%)
Major Soils	Hydrosol	Bigaa loam Dolongan loamy sand San Manuel clay loam Tingib clay loam	Quingua clay loam San Manuel loam Palapag clay loam	Catbalogan clay loam Tacloban clay loam	Catbalogan clay loam Faraon clay La Castellana clay	Mountain Soils
Major Present Land Use	Mangroves/Nipa Fishponds Coconut Trees	Paddy Pice Coconut Trees Diversified Crops	Coconut Trees Diversified Crops	Shrubs/Cogon grass	Shrubs/Cogon grass	Forest Kaingin Shrubs/Cogon grass
Remarks	Reserved tidal forests more than 20m wide along the coast			Soil Conservation Measures	Soil Conservation Measures	Reforestation

JICA Study Team, 1987

- Moderately sloping lands with deeper topsoils are selected for coconut-based farming because of the prerequisite for coconut growing. Furthermore, the selected areas not facing strong winds will be used for abaca plantation. In coconut or abaca plantations, intercropping with endemic fruit trees, cashew, pineapple, coffee, cacao as well as diversified crops such as upland rice, rootcrops, legumes and vegetables will be performed. Even though coconut is the major crop of the Study Area, the present yields are low, therefore, replanting of coconut tree is required for productive management. A small-scale livestock production will be introduced under the coconut plantation.

b) Agro-forestry

Agro-forestry will be established in marginal highlands under long-range development plan. Although past and current programs have concentrated on lowland farmers, upland farmers should be given a focused on because of their greater percentage. The uplands are suitable for agro-forestry, that is, diversified farming combined with soil and water conservation measures.

In the short-range development plan, on the other hand, only pilot projects of agro-forestry will be started at several locations. The test/demonstration farms of ipil-ipil and pineapple (in Catbalogan), corn/legumes (in Gandara and Pinabacdao), vegetables (in Hinabangan) have been planned by the provincial office of DA. Also, the Integrated Social Forestry Program is undertaken by BFD for settling the farmers performing Kaingin farming. Experiences from on-site pilot projects are necessary before extensive development efforts will be implemented.

Ipil-ipil (Leucaena spp.) will be planted with fruit trees or other crops as buffer strips of two to five meters wide in contour buffer planting (See Soil Conservation Measures). Crop production will be increased by improving soil fertility and by control of soil erosion. In this area, the integrated system of crop-tree-livestock will be introduced. Ipil-ipil is one of the effective protection plants and its leaves are good for feeds to raise goats, swine, etc. and for green manure or mulching materials. The trees can be used for firewoods. Fruit trees such as off-season citrus, cacao, coffee and cashew should be tested for their adaptability and marketability under the pilot project. Napier grass should be also tried for grazing animals such as carabao, goat and swine. The profitability of mushroom culture would be further studied.

c) Forestlands

Mountainous areas having slope steeper than 18% will be maintained as forests for multiple purposes; for example, timber lands and protective forest. For the logged-over area,

reforestation should be undertaken because the denudation of the watershed and forest areas is now threatening the ecological environment of the Samar province.

d) Grazing land

At present, most farmers do not graze their carabaos on fallow cogonal grasslands. The carabaos eat the young shoots of cogon grass. Livestock production is on a backyard scale only. Thus, livestock production in the Study Area has not been given much attention, while the potential is high considering the availability of wide pasture areas which could be utilized for communal grazing. Shrubs/grasslands will be used for grazing lands.

e) Wetland

Tidal swamp areas will be preserved as mangroves and nipa palm forests for wildlife sanctuary, that is, these are considered to be the best breeding places of fish species as well as a buffer for high tide. Occasional gathering of firewood or roofing material will be allowed but on a small-scale cutting down. Some parts of tidal swamp areas have been converted to brackish-water fishponds, especially in the bays along the littoral extending Tarangnan-Jiabong-Motiong and Wright-Calbiga-Villareal. The present yields of the existing fishponds are low and substantial increases in production could be achieved by the improvement and rehabilitation of these existing fishponds without any expansion of total fishpond area.

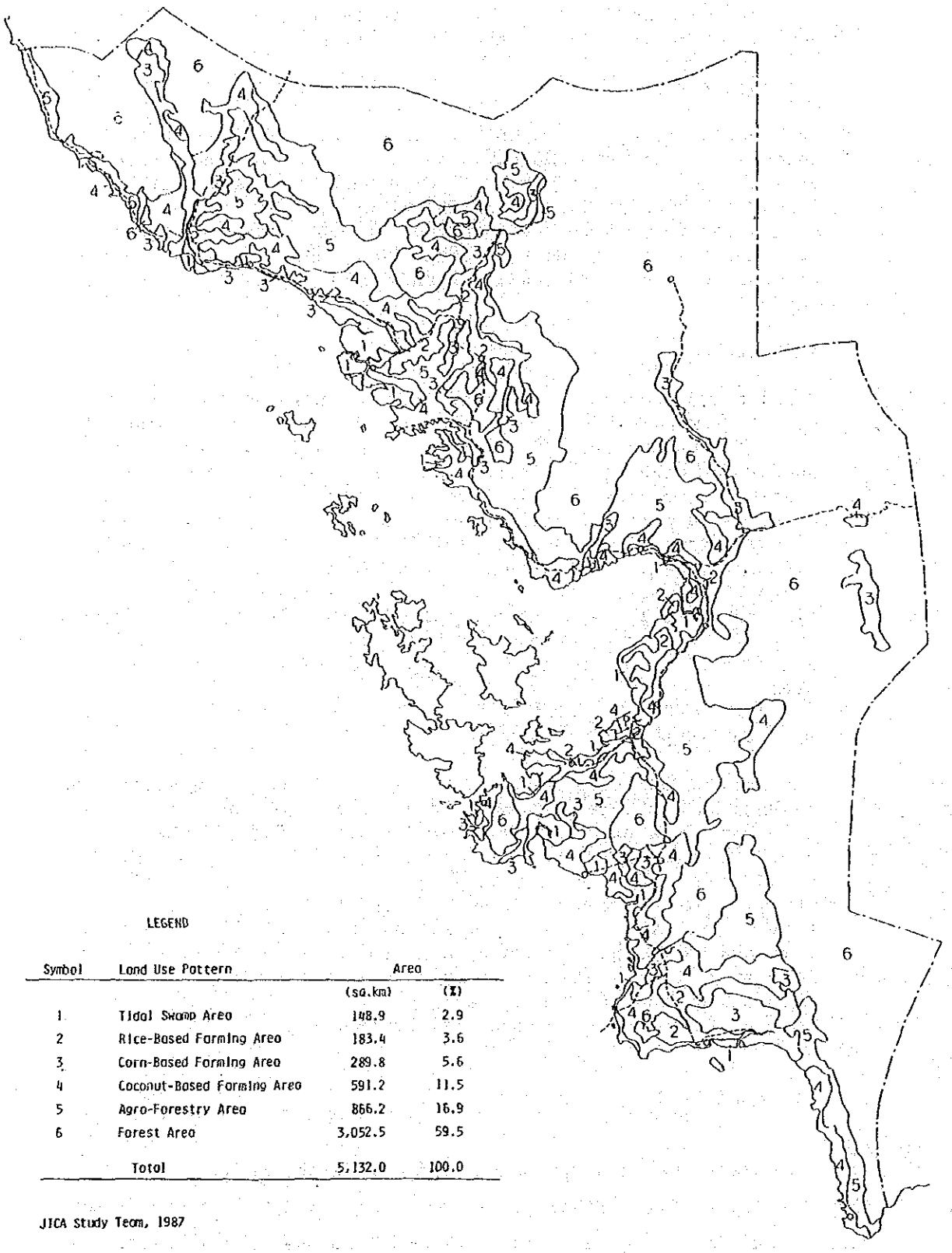
f) Built-Up land

The present built-up lands including settlement, commercial and industry areas were estimated from the data of Gandara, i.e., 195 ha or 0.4% of total municipality area. For the whole Study Area, the proportion was estimated to be 0.3%. In future, it would be extended to be 0.5% of the total area because of enlargement of urban areas such as the Calbayog city, Catbalogan, etc. and increase in road networks. The Calbayog city and Catbalogan maintain their roles as the major industrial center and also remain to be the outlets of agro-based products for processing.
Lack of farm-to-market road will be improved.

3) Proposed land use

The distribution of proposed land use in the Study Area is shown in Figure 5.2. Finally, of the total 5,132 km^2 of the Study Area in the Samar province, the proposed land use in comparison with the present land use is summarized in Table 5.1.

FIGURE 5.2. PROPOSED LAND USE MAP



LEGEND

Symbol	Land Use Pattern	Area (sq.km)	Area (%)
1	Tidal Swamp Area	148.9	2.9
2	Rice-Based Farming Area	183.4	3.6
3	Corn-Based Farming Area	289.8	5.6
4	Coconut-Based Farming Area	591.2	11.5
5	Agro-Forestry Area	866.2	16.9
6	Forest Area	3,052.5	59.5
	Total	5,132.0	100.0

JICA Study Team, 1987

N

0 5 10 15 20 km

Table 5.1. Comparison of Present and Proposed Land Use

Land Use	Present		Proposed			
			(Short & Medium-Range)		(Long-Range)	
	sq.km	%	sq.km	%	sq.km	%
I. Agricultural Area						
Paddy Rice	164	3.2	185	3.6	185	3.6
Diversified Crops	146	2.8	217	4.2	303	5.9
Coconut Trees	763	14.9	800	15.6	800	15.6
Fruit Trees	-	-	30	0.6	156	3.0
Kaingin	205	4.0	205	4.0	-	-
Sub-Total						
II. Forest Area						
Shrubs/Grasses	1,444	28.1	1,309	25.5	877	17.1
Forests	2,259	44.0	2,237	43.6	2,656	51.8
Sub-Total						
III. Wetland Area						
Mangrove/Nipa	126	2.5	114	2.2	114	2.2
Fishponds	10	0.2	15	0.3	15	0.3
Sub-Total						
IV. Built-Up Area						
Settlement/Others	15	0.3	20	0.4	26	0.5
Total	5,132	100	5,132	100	5,132	100

The steep slope lands will be reserved for forest in principle; accordingly, the agricultural development will be undertaken in the alienable and disposable lands of which extent is about 2,000 km^2 or about 40% of the total Study Area.

5.1.2. Soil Conservation Measures

1) Principles of soil conservation

Soil erosion is serious in hilly areas. Several trial and demonstration stations for soil conservation have been established as follows;

- Soil Research and Conservation Demonstration Station at Tarangnan, by BOS.
- Farming System Development Project, Eastern Visayas Site Research Management Units at Gandara and Basey, by BOS-ViSCA-Cornell University.

Large area of forest had disappeared as a result of logging operation and Kaingin farming. To minimize soil erosion, proper land utilization plan should be made. The erosion susceptibility is dependent on the slope, soil type and vegetative cover. The principles of controlling soil erosion are as follows:

- To reduce the velocity of runoff water.
- To maintain the high infiltration rate in the soil surface.
- To reduce the force of raindrops by crop interception.

2) Practical measures

In addition to reforestation of denuded lands in watershed, the practical measures of soil conservation for the Study Area are listed below;

- Cover cropping with Napier grass; Centrosema and Kudzu (creeping type); Ipil-ipil and Madre de cacao (tree type).

These plants cover the soil surface and prevent soil from erosion. They also add organic matter and nitrogen to the soil.

- Crop rotation for improving the soil structure and promoting infiltration of rain water.
- Contour buffer planting with the said cover crops as buffer bands of two to three meter wide.
- Strip cropping with contour, from two to three meter wide strips of crops.
- Water impounding ponds for minimizing the potential runoff. The water in ponds can be used for livestock and fish-culture as well as for irrigation.

5.2. Water Resources Development

5.2.1. Water Resources and Utilization Scheme

The Samar province is fortunate to be pluvious and have much water than needed. The total available water resources based on the water balance study is estimated at about one billion cubic meters (about 1,000 MCM) per year. On the other hand, the water demand in the year 2007 is estimated at about 570 MCM/year. The amount of annual water resources available is 1.8 times of the demand. (refer to Appendix C.4.1)

5.2.2. Hydrological Probability and Design Year

The probability analysis on rainfall, effective rainfall and consecutive drought days has been made by applying rainfall data available at Catbalogan for a period of 35 years. By using the results, the design year for water utilization scheme has been determined. (refer to Appendix C.4.2)

Design year: Drought year, 1968, equivalent to probability (w) = 1/10

5.2.3. Specific Discharge by Zone

As learned from the isohyetal map of annual rainfall and specific runoff in the Samar island, the runoff discharges differ greatly between the seashore area and hilly/mountainous area. Taking such hydrological factors and topographic conditions into account, the area is divided into three zones, and the annual discharge of each zone is estimated as follows in the design year. (refer to Appendix C.4.3).

Zone A;	(Seashore area)	87 MCM/year/100 km^2
Zone B;	(Hilly land area)	124 MCM/year/100 km^2
Zone C;	(Mountainous area)	186 MCM/year/100 km^2

5.3. Agricultural Development

5.3.1. Objectives, Targets and Strategy

1) Objective and target

Based on the study result of present agricultural situation, the development objectives/targets of agriculture are summarized as follows:

- Attainment of provincial self-sufficiency in the province-wise supply of basic food.
- Attainment of the maximum production of existing commercial/ industrial crops like coconut, corn, peanut, mungbean, abaca and root crops, accompanying with the development of agro-processing industries for these crops.
- Development of new cash crops (e.g. black pepper, coffee, cacao, fruits and vegetables, pili, cashew, ramie, salago, citronella and orchids) through promotion of research/ trials in strategic areas.
- Increase of production efficiency through introduction of small-scale machineries.
- Development of livestock and poultry breeding (e.g. carabao, chicken, swine, sheep/goat, duck) to attain self-sufficiency

of draft power and to satisfy protein requirement of the local population.

- Development of freshwater fisheries (e.g. establishment of hatchery)

2) Strategies

The strategies proposed to eliminate the bottlenecks of agricultural development to establish a systematic and well-coordinated remedies on the identified constraints as follows;

- A comprehensive agricultural development plan should be formulated to cover three components, namely (i) production (ii) farmers' organization and institutional development (iii) supporting projects.

- The production plan includes farming systems development in crop production as well as production of livestock, freshwater fish, and mushroom.

- The components on farmers' organization and institutional developments cover the organizations of farmers and the users of such infrastructure as irrigation systems and farm roads. The agricultural supporting services for farm credit, farm inputs supply, agricultural extension, marketing, processing and storage are also included in the plan.

- The supporting projects include the development of such agricultural infrastructure as particularly irrigation and drainage, water management, and flood control facilities and the land development by means of reclamation, plot diking, leveling, cadastral survey, etc.

- The change of approach to agricultural supporting services from the "purely commodity-specific and production oriented" to the "agro-industry linkage and community development oriented" should be promoted. Whole Barangay people, especially the majority of tenants or small farmers require improvement in the integrated agricultural/rural development.

- Development of Barangay based on leadership through establishment and strengthening farmers' organizations will be encouraged for the Barangay people to participate in planning, implementation, and operation and maintenance of the related agricultural development schemes.

5.3.2. Agricultural Development Plan

1) Proposed cropping pattern

The proposed cropping pattern by land category is prepared as shown in the Figure 5.3, taking into account the following conditions (for the further detail see Appendix E.2.1);

- There is little room to expand cultivation area at both the level land from zero to three percent slope and gently sloping land from three to eight percent slope, so these lands should be developed to increase cropping intensity. The farming systems in the lowland irrigated areas and rainfed areas should be intensified with the introduction of diversified crops, which will include such vegetables as string bean, bitter gourd, eggplants, etc. for the irrigated area and mungbean, peanut and corn for the rainfed area respectively.

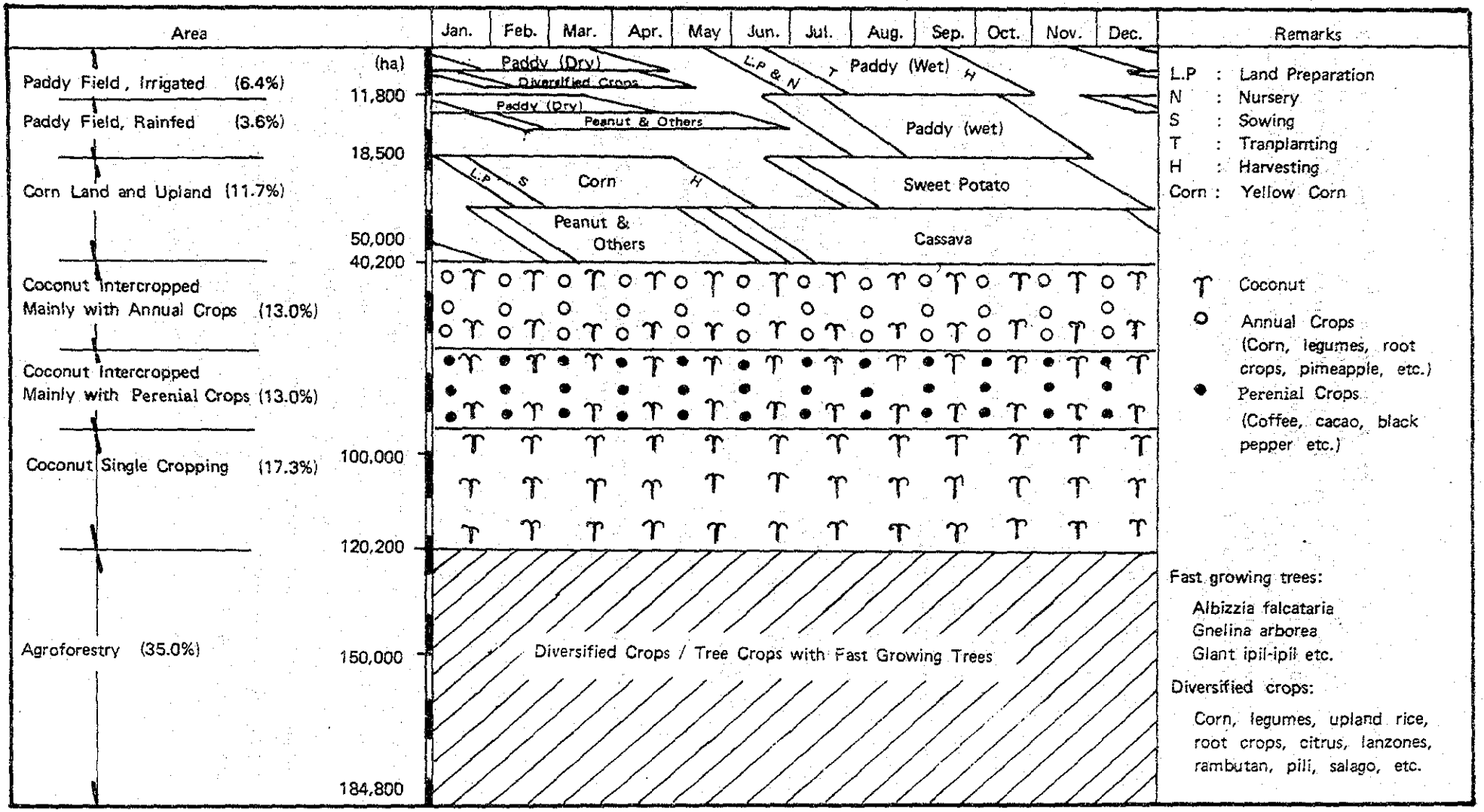
- Prior to implementation of irrigation and drainage projects, increase in number of carabaos and introduction of small scale farming machines will be required together with the development of on-farm facilities to raise yield to some extent. Multiple farming with cultivation of more different crops, semi-commercial scale livestock farming, carabao milk processing, etc. shall be encouraged along with development of the rice-based farming.

- In the flat or gently sloping area, corn-based farming will be developed. The crop rotation of corn, legumes like peanut and mungbean shall be promoted for maintenance of soil fertility. Tractors will be used by group for timely cropping and improvement of soil fertility through gradual deep plowing in some corn-based farming areas. Some trial/demonstration of ramie may be recommended in the part of the gently sloping area where soils are suited to grow it.

- In the area where coconut is planted with the slope of three to eight percent, inter-cropping will be introduced to a great extent with these crops of corn, peanuts, mungbean, vegetables, upland rice and pineapple. In the sloping area of more than eight percent, coffee, cacao, black pepper, banana, etc., will be inter-cropped.

- In the steeper area (more than 8% of slope), either contour/hillside farming of upland crops (corn, pineapple, and root crops) or coconut cultivation will be developed with contour buffer strip of leguminous plants.

FIGURE 5.3. PROPOSED CROPPING PATTERN (LONG TERM)



- As for the area where sloping is 15 to 18%, agro-forestry will be developed under the long-term development plan, aiming to raise the living standards in the internal Barangays. Various perennial crops like citrus, lanzon, guava, banana, rambutan, pili, cashew and salago, and also such annual crops as corn, legumes, upland rice, root crops, and vegetables may be grown together with fast growing trees.

2) Crop production

With implementation of the proposed agricultural development schemes as shown in the section 5.3.5, the total crop production will be increased to about 2.7 times of the present amount. The annual paddy demand in the Samar province at the end of the long term development period is estimated at 120 thousand tons as shown below:

Item	Demand (ton of paddy)
1. Food demand	111,800 1/
2. Seeds	1,200 2/
3. Others (7% of food demand)	7,800
Total	120,800

Note: 1/... 726,000 (projected population) x 100 kg per capita per year/0.65 (milling recovery).
2/... 23,300 ha x 50 kg per ha.

The paddy production exclusive of upland rice will be increased by 1.6 times of the present total production when the proposed projects are fully implemented, where the self-sufficiency rate of rice will be 84%. The production of other major crops, namely corn, sweet potato, cassava, mungbean, and peanut will be increased by about two to three times of the present production levels. So, a large amount surplus particularly for corn and root crops is expected on the basis of the projected demand at the end of the long term development.

A stable and sufficient supply of corn and root crops products will motivate investors to increase the production capacity of the existing feed mill or to establish new feed mills. The root crops could be substituted for some part of corn amount in feed processing. This will encourage livestock and poultry raisers in the Samar province.

It is estimated that the labor requirement of crop production will be increased to 1.4 times of the present amount. (refer to Appendix E.2.3)

3) Livestock production

a) Carabao

The utmost priority in livestock production schemes is given to the carabao dispersal to farmers who do not own one at present. The qualified recipient farmers who will be selected by farmers' organization in the strategic areas/Barangays will be obliged to pay back female carabaos from their offsprings in the scheme. Appropriate training and extension services shall be provided to upgrade carabaos. As a result of carabao population increase, the local cheese processing of carabao milk will be developed.

b) Other livestock and poultry

Upgrading of local swine quality and increase of swine population will be attained under artificial insemination services, which may result in the increase of farmers' income. For this purpose, the establishment of two more swine artificial insemination centers, aside from the existing station in Gandara would be recommended in the Master Plan.

One of the reasons for the shortage of carabaos may be that there are unregulated slaughters of carabao, as carabao meat is most favorite ones in the province. To minimize unregulated carabao slaughters there must be alternative source of meat. To this end, dispersal of pure breed or cross-breed sheep and goats is recommended in the areas outside the lowland area by DA in the Samar province. On the other hand in the lowland areas, duck dispersal program will serve for the supply of duck meat in the local areas and also for the export of duck egg to other provinces. Furthermore, the dispersal of broiler cockerels and piglets will serve to increase the income of landless-farm laborers or tenant farmers. The Gandara Breeding

Station shall be strengthened to multiply the livestock and poultry sufficiently by means of increasing the stock animals and introducing artificial insemination equipment. To minimize outbreak of livestock disease it is proposed to establish an animal diagnostic and treatment center in the Gandara Breeding Station. On the supposition that the number of carabao, cattle, goat and sheep will be increased to two times of the present number of them with implementation of the related livestock development schemes, the labor requirement will also be increased by two times of present labor requirement. (refer to Appendix E.2.4)

5.3.3. Agro-Related Production

1) Freshwater fishery

Establishment of one hatchery and three nursery pond facilities for freshwater fishculture of tilapia, carp, etc. has been proposed to upgrade the protein nutrient standard in the inland areas. Taking into consideration the following points, this kind of fishculture development project is recommended to tap the development potential;

- Tilapia and carp are regarded as major foods not only at national level but also in the Northern Samar province. Some farmers already requested tilapia fingerling supply in the inland Barangay Calbiga.
- In many inland Barangays, where fish is scarce although sufficient water resources are available.
- Application of integrated fish farming (fish-livestock-crops) could maximize productivity of all available spaces because the manure promotes growth of plankton which is food for fish.

Rice-fishculture in a paddy field could be promoted in irrigated paddy field areas, where tilapia, catfish, snails, etc. will be introduced.

2) Mushroom

The development of mushroom production would contribute to support the government nutrition program and to increase farmer's

income. Farm waste can be utilized for mushroom production. The establishment of a mushroom spawn production unit is included in the Master Plan.

5.3.4. Agricultural Institutional Development

1) Institutional renovation

a) Proposals

Among the various roles which are expected, under the Master Plan, to be efficiently played by the farmers themselves through their organized efforts are; (i) agricultural production increase through provision of advanced supporting services; (ii) operation & maintenance (O & M) of the improved irrigation and drainage facilities and farm roads; (iii) O & M of public utilities including potable water supply and rural electrification which would be newly provided, and (iv) maintenance of facilities for social services such as public health, education and housing which are expected to be newly added or largely improved.

Apparently, through a combination of (i) and (ii) above, the farmers' living standards would be very much raised through implementation of the Plan, and items (iii) and (iv) should serve to qualify the higher living standards thus brought within the reach of the villagers.

b) Self efforts

All development components are envisioned for their implementation through strenuous efforts on the part of the agricultural population in the Area. It would, therefore, be imperative to let them understand the aims and purposes, together with the strategy and tactics for turning the Integrated Development Plan into reality. There will, however, be least need for them to learn new developmental theories because the promised results will be attained in due course of time through the beneficiaries' concerted efforts in adhering to the prescribed tasks and exercises which will be advocated in the Master Plan.

2) Improvement and practical methodology

a) Advanced supporting services

The basic approach for realizing this item is through cooperative system. The Philippines has half-a-century history of cooperative development and even though it has not made progress as originally aspired for due to miscellaneous causes

and reasons, there is no reason to make a hasty conclusion that cooperative has no future in this country. Instead, there will be strong arguments that the Philippine agriculture has now arrived at such an impasse which can be pushed through only by adhering to the cooperative principles in and through all the aspects beginning from land preparation to post harvest proceedings.

Reflecting upon a rather unhappy course of cooperative development in this country, its rehabilitation on a sound base is now proposed as follows:

- To stop divorcing input supply from provision of rural credit, which often induce the cash-hungry farmers toward misuse of credit for consumptive purposes, or adherence to the cooperative "supervised credit system" endorsed by appropriate technical-economic guidance on the field;

- To put greater emphasis on the post harvest operations aimed at enhancement of the marketing value of the products;

- To safeguard the members' economic standing through eradication of the common snares which bind up the small farmers in unredeemable indebtedness through encouraging the farmers to deposit most of their sales proceeds in their cooperative savings against which they can obtain most of their daily necessities from the cooperative shop without cash payment;

- To strengthen a perpendicular linkage between the local unit cooperatives or Samahang Nayon and the area federations dealing with credit and marketing, or to stop abandoning the primary cooperatives in helpless isolation.

The above may be recapitulated that the proposed cooperative development program is meant for providing the grass-root farmers with all the requisites for agricultural production plus the minimum necessary amenities of life for them and their families, and let them carry on farming under an intensive technical-economic guidance so that they can enjoy bumper harvest which shall be disposed at the most advantageous terms and conditions and the lionheaded share of the sales proceeds kept in their cooperative savings which would provide for off-season living and, possibly, a part of next season production capital.

The question as to how the impetus for this kind of cooperative rehabilitation can be given under the Master Plan is duly answered by the program which has been prepared in view of reproducing this type of cooperative module in widening area of the country starting from the Samar province. This program will be implemented in conjunction with ADPP.

b) Development of priority project

Cooperative center which is taken up therein shall assume such a shape and is meant for such a function. (refer to Appendix L.3)

c) O & M of irrigation/drainage facilities & farm roads

This work through the organized efforts among the farmers may take a form somewhat akin to the Irrigators' Association. Functionally, farmers' organization for O & M of the irrigation and drainage facilities will take on its own shoulder the O & M of the farm road, too. Technically speaking, the farm roads also serve as maintenance roads of canal system.

d) O & M of public utilities

Water supply plan proposes to escalate the potable water distribution system from Level I service, according to the urbanization stage obtainable in each locality. The beneficiaries' organization meant for O & M of the proposed water supply system should accordingly be shaped and manipulated in such a manner as is practiced by RWSA through the kind offices of DLG, or somewhat more sophisticated group, upon consultation with LWUA.

As for the counterpart organization for O & M of rural electrification, its proper shape and function will eventually be decided through a series of study between NEA which is held responsible for the rural electrification and development of mini-hydropower generation; NEA may as well recommend annexation of the beneficiary village organization with the nearby ELCO.

e) Maintenance of facilities for social services

This job belongs to the traditional group-labor which has long been practiced in Barangay in the name of "Communal Work" (refer to Appendix L.3). Barangay inhabitants' work on a community-wide basis used to comprise free labor for community purposes such as the Fiesta, for repair of Barangay chapel, for repair of the school, or for repair of bridges. Repair of Rural Health Unit (RHU) and Barangay Health Station (BHS) can be attended at as unquestionably as the repairing of the elementary and secondary schools, to say nothing of neighborhood mutual help in housing undertakings.

3) Rural workers development

Workers Amelioration & Welfare Division, Department of Labor & Employment (WAWD, DOLE) in Tacloban has been vigorously promoting,

since 1979, the Rural Workers Development Project in Region VIII. (refer to Appendix L.4)

Since 1982, this project has had as the guide line of its operation the integrated approach which is firmly supported by four pillars of; (i) Rural research program; (ii) Rural education & organization program; (iii) Rural projects development program, and (iv) Rural amelioration program.

The thrust of this project came to be enormously accelerated with the emergence of the new administration in the Philippines so much as 56 Rural Workers Organizations (RWOs) composing of more than 1,900 membership have been registered within the last 20 months. Roughly a half of them are spreading in the Leyte island and the other half, in the Samar island, four in the Samar province. Professional background of a majority of the organized rural workers is agriculture/fishery.

Under this project, the maximum efforts are being focused nowadays on promotion and implementation of rural livelihood development program which is aimed to provide the rural workers access to capital and to strengthen or improve their socio-economic conditions through:

- Improving the capabilities of rural workers' groups by turning them into cohesive production units;
- Supporting organized rural workers' groups in undertaking economically viable projects through the provision of adequate funding for such projects;
- Developing credit consciousness and management expertise among rural workers;
- Extending technical services of peasant groups on various productive activities;
- Promoting the diversification of more agro-based industries on a small and medium scale basis.

This livelihood development program has been supported by the credit schemes such as the DOLF-LBP Loan Guarantee Program for the landless workers, the DOLE-RPB Livelihood for the Sugar Workers Fund Program, the 30% Social Amelioration Fund, and various self-help projects into which a minimum necessary fund has been replenished as the "pump-priming water". However, all these programs and services have perennially been constrained with financial difficulties especially the credit scheme. In fact, the credit scheme of this office has nowadays dwindled down to the lowest horizon and, if even there is any, it is usually saddled with bureaucratic banking requirements which often result in untimely or delayed assistance to would-be beneficiaries.

5.3.5. Agricultural Development Schemes

1) Concept of schemes

Corresponding to the foresaid agricultural development plan, it is proposed to implement the related agricultural development schemes. These agricultural development schemes include the demonstration or trial of farming system development, the dispersal of livestock, the development of freshwater fishculture, and the related agricultural supporting schemes to farmers or farmers' organization. (refer to Appendix E.2.5). The concept to formulate these schemes are shown as follows.

- The extension unit in each agricultural development scheme will not go beyond the Barangay level in principle. The participants to the demonstration and livestock dispersal schemes will be selected by the whole farmers in the Barangay concerned, without speculating on the forefront position of the few modern farmers.
- Such farm inputs and farm facilities like planting materials, dispersed livestock and farm machinery will be rendered to farmers or farmers' groups under the condition that they will pay back in kind or from harvest. The paid planting materials, dispersed livestock and farm inputs will be utilized to other schemes.

Since the cooperative capacity and/or willingness of Barangay people seems to be very poor under the prevailing rural structure in the province, damages of birds, rats and wild ducks to small patches of cropping due to lack of cooperation among farmers would be severe to considerable extent in the Study Area. Furthermore, there are many farmers who have strong tendency to stick to their way of thinking and method from their experience which are succeeded from one generation to another.

2) Agricultural Development and Promotion Project (ADPP)

Under the circumstances, it needs to demonstrate and verify the adaptability of improved farming technology through implementing the pilot project of the said agricultural development schemes. For this purpose, it is proposed to implement the Agricultural Development and Promotion Project (ADPP), which will accompany a center in San Jorge municipality and three sub-centers in the Calbayog city, the Calbiga and Basey municipalities to cover the said four areas.

Among the various agricultural development schemes, high priority ones shall be implemented in the early stage. The criteria to select the priority schemes are as follows.

First priority:

- To contribute to the increase of farm income with small amount of investment.
- To provide with the indispensable agricultural support services for the priority schemes like training of the concerned personnels and farmers' leader and strengthening agricultural extension activities.
- To have close location of site to ADPP center or the sub-centers.

Second priority:

- To be the same schemes with the first priority and to be located in the surrounding areas of the first priority.

- Any other schemes to render indispensable supporting services for the second priority schemes.

Third priority:

- Any other schemes than the above schemes

The agricultural development schemes with priority is indicated in Appendix E.2.5 and the first priority scheme is shown as follows;

a) Development of rice-based farming

- Irrigated paddy/diversified crops cultivation (on-farm demonstration- OFD)
- Rainfed paddy/diversified crops cultivation (OFD)

b) Development of corn-based farming

- Corn cultivation with rotation of other crops (OFD)
- Contour/hillside farming (OFD)

c) Development of coconut-based farming

- Coconut replanting/planting with improved varieties together with applying coconut intercropping (OFD)

d) Trial/demonstration of agroforestry

e) Development of Abaca and other fiber crops

- Abaca seed bank
- Abaca replanting/planting with improved varieties (OFD)

f) Livestock development

- Carabao dispersal
- Swine artificial insemination center
- Sheep/goat dispersal (including sheep/goat stock production scheme)
- Duck/chicken disperal (including broiler cockerels and ducklings production schemes)
- Animal diagnostic and treatment center

g) Freshwater fishery development

- Hatchery (including fish-livestock-crops integrated farm model)
- Nursery facilities and integrated farm (including the above-mentioned)
- Backyard fishpond and cage fishculture

h) Municipal nursery station

i) Soil Analysis and Inoculants Laboratory

j) Seed Test Laboratory

k) Crop protection system development with emphasis on surveillance and early warming system

l) Development of farmers' organization

- Barangay management development
- Barangay-based multi-purpose agricultural cooperative development
- Marketing assistance

m) Agricultural extension activity strengthening

- Strengthening of extension staff with the related facilities
- Establishment of Agricultural Development and Promotion project

n) Post Harvest facilities and marketing development

- Post harvest facilities improvement (paddy)
- Post harvest facilities improvement (coconut)
- Coconut timber utilization
- Marketing assistance

5.4. Non Agricultural Sector (Industrial and Service) Development

5.4.1. Small Scale and Cottage Industries

1) Rural industrialization of the Samar province

As shown previously in Section 3.4.1, there has not existed a considerable industry. Therefore, the Government, DTI as well as the PEC will take the initiative to promote the rural

industrialization of the area. The policies of DTI in compliance with the investment plan are clearly summarized as follows;

- Investment priority plan with the condition of good economic return;
- Export priority plan with the condition of possible export encouragement;
- Technology priority plan with the condition of having a specific technology.

DTI authority clarified the policy of selection as; existence of raw material, technology and export-oriented one.

2) Agro-industry

The most advantageous industry should be chosen firstly by the criteria with abundant existence of raw materials, that is, agriculture products. The materials of coconut, sweet potato, cassava, banana, guava, avocado and pili have surplus of production considering the self-sufficiency (refer to Appendix E.3). There are also other crops which have high potential to be used as materials for processing like gabi, pineapple, squash, black pepper, etc.

3) Manufacturing and other industries

In the case of manufacturing, the priority shall be chosen from a slightly different point of view. Though abundance of raw materials shall be considered, more importance shall be on the requirement of customers; marketing aspect. In this sense, it is necessary to make the marketing study again prior to any manufacturing activities. (refer to Appendix B.4.4)

5.4.2. Marketing

1) Marketing of agricultural products

As shown in the Section 3.4.2, there exists no suitable marketing system in the Samar province for agricultural products at present.

First of all post-harvest facilities such as transportation means and storage houses shall be adequately installed in accordance with the growing needs. In this regard, NFA is expected to enlarge its activities for giving the incentive to the private sector.

Secondly, since NFA's procurement amount is too small to stabilize the farm-gate price of major crops such as rice and corn, it is recommended to increase its amount even by overcoming the various obstacles.

Thirdly, accompanied with installation of infrastructure mentioned above, the price of other major crops shall be maintained at a certain level.

Fourthly, against "suki" system by which farmers obtain the inputs and other household consumable goods in advance (by selling the crops before harvesting at abnormal low price), the financial services by banking system shall be more extended than before.

Finally, the farmers' cooperatives described hereunder shall have a meaningful role to improve the marketing system of agricultural products.

2) Cooperative activities

On the other hand, the farmers' cooperative will be enforced to have a role to handle the selling of agricultural products and, at the same time, the purchasing of certain materials in bulk such as fertilizer and pesticides.

3) Marketing assistance program

For evaluating the market mechanism, the philippine authorities have promoted the Marketing Assistance Program, the contents of which have many variations. Marketing structure has a characteristic of social structural aspect to which even the governmental authority could not easily interfere. It is, however expected that the foreign assistance would also participate in that kind of program. (refer to Appendix B.4.4)

5.4.3. Financial and Other Services

The activities of financial organization vis-a-vis the production loan has been fluctuated by the agricultural producers in the the Samar province. On the side of borrowers, firstly, there is a need to increase their credibility; for example, guarantee created by farmers association. Secondly, the public banks and NFA should hopefully increase their lending amount to the users in the Samar province according to the increase in financial needs. These lending activities need the guarantee in case of bad harvest. The PCIC in coordination with DA should work towards encouraging the farmers to ensure their crops.

Note: In this article, it is limited to mention inevitably too much generalized orientation, since the subject of rural industrialization, marketing and financial & insurance system which are not the main objectives of this study will require a much more detailed further studies.

5.5. Infrastructure Development

5.5.1. Irrigation

1) Irrigation planning

Attaining needs of self-sufficiency of rice in the Samar province, and considering topographical, meteorological and

hydrological conditions, and double cropping system of paddy would be recommended. The first and second paddies are transplanted in December and June and harvested in March and September, respectively. (refer to Section 5.3.2 in this volume)

The water sources for the proposed irrigation areas are springs and/or surface water in a river. The critical months of surface water on discharge are March, April and May, but the appearance of those months are not fixed year by year. The minimum specific discharge on the probability of 1/10 is estimated at 0.97 m^3/sec/100 km^2 in the coastal area in May. (refer to section 3.1.6)

The monthly evapotranspiration ratio is calculated by the modified Penman method based on meteorological data at Catbalogan. The maximum and minimum rates of 6.1 mm/day and of 2.9 mm/day of evapotranspiration have been calculated in April and January, respectively. The crop coefficient (kc) ratio fluctuated from 0.95 to 1.1 for the first crop and from 1.0 to 1.25 for the second crop. Therefore, monthly ETcrop rate will vary from 6.5 in May to 4.6 mm/day in September for the second crop. The percolation rate of one mm/day could be used by considering the clay soil texture of a paddy field.

The amounts of water for land preparation on the first and second cropping are 210 and 270 mm, respectively. Irrigation efficiency of 0.51 inclusive conveyance loss of 20% on the main and lateral canals, distribution loss of 20% and application loss of 20%, could be applied in designing the facilities. The maximum amount of diversion water requirement, therefore, is calculated at 1.7 lit/sec/ha. The cropping intensity of paddy will vary from 130 to 200% depending on the amount of water source and cropping calendar. (refer to Appendix F.1.4)

2) Proposed irrigation system

The first priority to irrigate the target area should be given to the rehabilitation works of the existing irrigation systems due

to lower operation and maintenance cost. The second priority would be given to the rehabilitation works of the existing pump irrigation systems due to higher O & M cost. The new construction of irrigation systems is placed on the following position. The small scale water impounding scheme would be also proposed depending on the topographical and geological conditions such as foundation of a dam and its reservoir area. (refer to Appendix F.5)

In the Study Area, 36 rehabilitation projects of the existing CISs and PISs will be proposed with the high priority because of farmers' needs and experiences of the irrigation system. Also 53 irrigation projects would be proposed by considering the topographical conditions and water resources based on the topo-maps on a scale of 1:50,000. After completing the above projects, the irrigable area will expand to 11,830 ha. (refer to Appendix F.2)

The proposed irrigation facilities should be designed based on the topographical conditions such as location of water sources and irrigable area, water quality, a catchment area at an intake point and so on. In order to well operate the irrigation facilities, an intake facility of a diversion dam or a pumping station with a measuring device, main and lateral irrigation canals, O & M road with three meters width, appurtenant structures should be provided. Especially, O & M road will play a vital role in farming, because of its dual purposes such as operation and maintenance of a canal and a farm-to-market road which could be used by the farmers. On-farm facilities is also included in the facilities.

5.5.2. Drainage and Flood Control

The design rainfall of 304 mm/2-days on a probability of 1/5 based on the Catbalogan rainfall data by using the runoff coefficient of 0.8 and the design rainfall, the drainage module of 14 lit/sec/ha would be calculated for the design of proposed drainage facilities. (refer to section of 3.1.4 and Appendix F.3.3)

Considering the farm income from agriculture products, hydrological conditions such as tidal, flood damages and occurrence of flooding in the Jibatan, Gandara and Basey River basins, the gravity drainage system would be advisable, because of the relatively lower O & M cost compared with the mechanical drainage system. (refer to Appendix F.3.1 and F.3.2)

Many schistosomiasis endemic areas are observed in the low-lying area. There are many countermeasures such as medical checks, medical prescriptions, education of farmers, inputs of chemicals to the snails colony areas, sanitary treatment, etc. Only one countermeasure is not fully effective to control schistosomiasis. Considering the life cycle of schistosomiasis, it is important, in order to decrease the number of schistosomiasis victims, that the number of snails is reduced. The destruction of living environment of the snails is one of the effective countermeasures of the schistosomiasis control in corporation with other measures. The snails live in shallow swampy areas and grasslands within about 30 cm of water depth and small water velocity of about less than 30 cm/sec. The introduction of the drainage system in the problem area is effective for the schistosomiasis control in order to dry up the above drainage area. (refer to Appendix K.3)

2) Drainage facilities

The proposed drainage facility consists of main drainage and lateral canals, and many appurtenant structures such as road crossings, bridges, drops, etc. The operation and maintenance road with the minimum three meters width would be provided on a side for dual purposes of well maintenance of facilities and also of a farm-to-market road.

The drainage improvement will be implemented in the schistosomiasis endemic areas. The total acreage of the areas would be measured at about 9,150 ha based on the topo-maps on a scale of 1:50,000. In those areas, the drainage facilities of main, lateral and on-farm drainage canals should be constructed. (refer to Appendix F.2)

5.5.3. Road

1) Development objective

The development objectives are to improve the accessibility from the town to the rural area so as to vitalize the agricultural production, and to support agricultural development and other infrastructure development.

The roads are classified as follows:

Road Classification	Administrative Classification	Function
- Primary Road	National Road	Inter-region
- Secondary Road	Provincial Road	Inter-region, Farm-to-Market Road
- Feeder Road	Barangay Road	Inter-village, Farm-to-Market Road
- Farm Road	Other Roads	Hamlet-to-Farm Land

The rural road development is promoted by the following schemes.

- Farm-to-market roads connecting productive areas with market centers shall be improved or constructed..
- Provincial roads on the network shall be improved and constructed.
- Roads connecting between a Barangay and the adjacent Barangays shall be constructed to improve communication conditions in the rural area.
- The by-pass road shall be provided for the heavily populated towns and thus improved its environment.
- Regarding the pavement of the road, national and provincial roads shall be of concrete type and Barangay roads shall be of gravel type.
- The trunk farm road shall be provided wherein the area of the large scale cultivating lands with irrigation development for the purpose of efficient supporting the agricultural productivity.

2) Development strategy

Provincial road shall be improved or constructed with the gravel surface type in short term development in order to improve the accessibility to the provincial capital. The surface of provincial roads will be gradually improved to all-weather type (concrete) until the end of long term development. Upgrading and improvement of existing Barangay roads and (farm-to-market roads) shall be completed by the end of medium term development.

Farm-to-market roads are mainly utilized for transportation and distribution of the agricultural production and the agricultural inputs such as fertilizer. Merits of providing farm-to-market roads are saving the transporting time, reducing the labor force for transportation, increasing the transport capacity, and promoting the increase of agricultural products. Therefore, farm-to-market roads connecting between agricultural productive areas and consumption centers shall be completely provided as early as possible.

Roads linkage of connecting the heavily populated towns and other provinces will be constructed. Timber bridges along major routes shall be replaced by permanent bridges such as a reinforced concrete bridge.

It is recommended that the maintenance equipment under DPWH shall be strengthened.

3) Program and target

Regarding the construction and improvement of roads and bridges, the total length of the road construction is 810 km and that of improvement is 530 km by the end of long term development. The total length of the bridge construction and improvement is 4,400 linear meters. The total length of roads in the Samar province will be 1,730 km and the road density will increase from 0.16 to 0.31 km per km^2 of land area and from 1.63 to 2.42 km per 1,000 population

by means of the accomplishment of long term development. (refer to Appendix G.1.2) The total length of the trunk farm road construction is 150 km by the end of long term development.

In order to achieve the objectives above-mentioned, three targets for development are set as follows.

a) Target for short term development

Targets of this development are the road construction, improvement of the inaccessible route from some municipal centers to the provincial capital, the improvement of existing Barangay roads (farm-to-market roads) under bad condition, the construction of Barangay roads (farm-to-market roads) and the construction of the trunk farm road connected with farm-to-market roads in main productive areas.

Main components in the short term development are the five provincial roads between Basey and Marabut, Gandara and Matuginao, Tarangnan and Pagsanghan, Villareal and Talalora, and Calapi and San Jose de Buan.

b) Target for medium term development

Targets are gravel surfacing of the existing unpaved portion of Barangay roads, construction of the farm-to-market roads in the agricultural productive areas, construction of Barangay roads between the populated Barangay and the adjacent Barangay, and construction of by-pass roads. Main components in the medium term development are composed of Barangay roads in Jibatang, Gandara, Calbiga, Basey areas and Calbayog diversion roads.

c) Target for long term development

Targets of this development are construction of roads connected with all of Barangay in each municipality, construction of roads linked between a municipality and the adjacent municipality, the Samar province and other provinces, and the improvement of the provincial road connecting the municipal center of agricultural productive areas as all-weather type.

Main components in the long term development are composed of improvement or construction of Barangay roads, provincial roads under all-weather type, and link roads between Matuginao and Catubig (the Northern Samar province), and between Basey and Borongan (the Eastern Samar province).

4) Estimation of future traffic volume

The future traffic volume in the long term development is estimated by taking into account the general traffic volume and the agriculture-related traffic volume. The estimated traffic volume is shown about three to five times of the present traffic volume. The average annual traffic growth rate is assumed at 6.0%.
The daily traffic volumes on Maharlika Highway between Basey and the Calbayog city, on the other national roads and the provincial roads are estimated at from 1,000 to 2,200, from 500 to 1,000, and from about 100 to 500, respectively. (refer to Appendix G.1.2)

5.5.4. Transportation

1) Road transportation

It is expected that service level of road transportation will be strengthened by improving the road network and accessibility to the remote area.

a) Development objective

An efficient system of public transportation will be established in the Samar province by using buses and jeepneys for both intra-regional and inter-regional transports.

b) Development strategy

In order to introduce public transportation in the remote area, jeepney and bus terminals will be constructed at populated and geographical centers added to the improvement of the existing jeepney and bus terminals in Catbalogan and the Calbayog city.

c) Development program

Development program consists of improvement of the existing terminals and construction of new terminals.

- The expansion and improvement of Catbalogan terminal will be required at the present place in the short term development period.

- The improvement of the Calbayog terminal will be required at the present place in the short term development period.

- The Gandara terminal will serve the area between Catbalogan and the Calbayog city, especially the remote areas with buses and jeepneys in the medium term development period.

- The southern part of the Samar province will be covered with the public transportation service from a terminal in Basey in the medium term development period.

2) Sea and riverine transportation

a) Sea transportation

The municipal ports along Maharlika Highway are mainly utilized for fishery purposes and transportation between the mainland and island towns. It also at present serves transportation between the mainland and its adjacent towns that have no access road connecting each other. However, after the completion of improvement and construction works of proposed roads, these municipal ports will still mainly be utilized for fishery purposes and transportation only between island towns and the mainland.

Catbalogan and Calbayog ports are important for transportation of agricultural output and commerce in the province. PPA has a development plan of the Calbayog port regarding the rehabilitation of wharf and the access road by the year 1993. However, it is difficult to estimate future number of passengers and load of cargo at Catbalogan and Calbayog ports because the data of the distribution by sea transportation and road transportation by ferry in the Northern Samar province is not available. Then, the rehabilitation of the Calbayog port is only programmed in the short term development.

b) Riverine transportation

Riverine transportation on the Basey and Gandara Rivers is important for the remote areas. It is proposed, however, that road transportation will take the place of riverine transportation in the medium term development. For the purpose, the roads along the river shall be provided since riverine transportation require much more time than road transportation and riverine transportation is not frequently navigable during floods. Therefore, it is noted that there is no recommendation in the future development program for the riverine transportation.

3) Air transportation

The improvement of the Calbayog airport was programmed in the Provincial Development Investment Program (1988-1992) which includes apron expansion of 3,644 m^2 and runway expansion of 900 m^2. The district office of DPWH in Catbalogan is proposing the improvement of the Catbalogan airport. The total cost is estimated at about 70 million pesos. It is noted that the construction of any proposed domestic airports were not mentioned in Medium-Term Philippine Development Plan (1987-1992) but only improvement of domestic airports.

Bureau of Air Transportation does not have any plan for construction of domestic airports in their long term targets. Therefore, the improvement of the Calbayog airport only is recommended. As for the Catbalogan airport, it is necessary to conduct a further study.

5.5.5. Mini-Hydropower Development

The Samar province is so pluvious and there are many potential sites for mini-hydropower development although small in their size. In future, the hydropower generation will be given an important role for rural development as the rural electrification is promoted from linear progress into networks.

For the time being, the power in shortfall will be supplemented by receiving power from the Leyte-Samar Subgrid of NPC. However, hydropower development will be most effective, particularly in the remote rural area to eliminate shortfall in power supply at the distribution terminals and to reinforce the whole grid of the territory. (refer to Appendix H.3.1)

1) Potential hydropower generation

Hydropower is created by changing the energy of flowing water to electricity. The energy of flowing water is interpreted by head

and amount of flow (discharge). Taking into consideration the field physical conditions and social environment together with above-mentioned energy of flowing water, hydropower development will be planned. Planning procedures of the hydropower development can be summarized as follows: (refer to Appendix H.3.2)

a) Selection of hydropower potential site

Selection of the hydropower potential site generally begin with findings of the site on topographical maps, and field investigation and topographic survey are followed by studying the selected sites on their engineerings and social conditions of the related area.

b) Type of hydropower generation

As for the field investigation and selection of the potential site, type of the hydropower generation shall be taken into consideration. The type of the hydropower generation is classified according to the type of structure into three types, conduit type, dam type and conduit and dam type.

Conduit Type: Suitable for the site located at the upper or middle reaches of a river with steep gradient.

Dam Type : Requiring a regulating high dam construction in a river to store water and to obtain a head and has a power plant located immediately downstream or in the vicinity of the dam.

Dam and Conduit type : A combination of the dam and conduit types is usually constructed in the middle reaches of a river.

c) Estimation of necessary water for power generation

The necessary amount of water for power generation is calculated by estimation of keeping the power plant to be operated fully throughout the year. Dimension of the hydropower plant is determined by the available maximum water which affects the construction cost, operational efficiency, etc.

For the effective hydropower generation, it is necessary to maintain stable power supply throughout the year, and when the water is not abundant, the lower discharge (available in 275 days throughout year) is employed, while in case of the wet discharge, 90-days or 60-days discharge should be taken even though a part of the facilities are in idling. In

power-history, the former case should be employed for using hydropower as a main source, while the latter case is considered for mini-hydropower generation in the complement of thermal power as the main source with fossil fuel or nuclear power.

d) Estimation of water head

Selection of the potential site shall be made on the general understanding of the topography, geology, hydrology and additionally on the basic idea on expected construction roads, generation type, relation of the existing transmission/ distribution lines, and operation method. The water head available for hydropower generation will be estimated by reviewing the existing topographical map and confirmed by the field investigation.

e) Power output and volume

Theoretical hydropower generation can be estimated by discharge and water head, and theoretical equation is obtained by the following:

$KW = 9.8 \times Q \times H$ Where; KW: Theoretical hydropower in Kw
Q : Discharge in m^3/sec
H : Water head in m

f) Selection of turbine generator

The turbine generator shall be selected by the kind and type to meet the availability of water head, water volume, etc. For the small scale plant, however, there may be only small range of choice of the necessary equipment due to the limited conditions of cost, reliability in functions and delivery, etc.

2) Theoretical potential hydropower generation

Theoretical potentiality of the hydropower generation is studied based on average annual rainfall by area and elevation and available head up to the power plant. (refer to Appendix H.3.3) By applying an equation of the theoretical hydropower generation, the total theoretical hydropower generation in the Samar province can be calculated at 800,900 KW or 156 KW per km^2 of the Study Area.

Taking into consideration the efficiency, practical hydropower generation will be at about 400,000 KW or about 70 KW per km^2 of the Study Area. The existing hydropower generation is only 1,080 KW or 0.3% of the whole potentiality.

3) Development plan

Potential sites of the hydropower generation in the Samar province are planned based on the results of the field survey and study on the engineerings in the hydropower generation. (refer to Appendix H.3.4) As a result of the study, 16 potential sites of the hydropower generation are found as suitable sites for development under the Master Plan.

Out of 16 potential sites, only a site at Bugton is proposed to be developed in the short term development. Two sites, Ulot River and Blanca River, are proposed for the medium term development, while the rest of 13 potential sites are included into the long term development.

5.5.6. Rural Electrification

Rural electrification is being promoted by ELCOs under the supervision of NEA. In the Samar province, there are two ELCOs, SAMELCO I and SAMELCO II to handle the distribution of the electricity in their territory and also to carry out the rural electrification in providing electric distribution lines as energized Barangay and the secondary distribution as house connections.

Electric distribution system shall be developed to electrify all Barangays and to cover all households as house connection by the target year of the Integrated Agricultural/Rural Development Project according to the on-going plan of the electrification. By the plan, the municipalities of Matuguinao, San Jose de Buan, Marubut and municipalities of islands will be electrified by the year 1989 by SAMELCOs. (refer to Appendix H.4)

The schedule of the secondary distribution development in the Samar province is proposed at 50% of the secondary distribution for the short term, 30% for the medium term and 20% for the long term development.

5.5.7. Water Supply

1) Basic concept of development program

The basic concept of the development program for the water supply master plan is categorized as follows:

a) On-going Level I services (include Level II services)

Construction and rehabilitation of wells for Level I services are underway under the financial assistance of IBRD, OECF, and others. Since the program is being carried out under foreign assistance, Level-I service was excluded from this Master Plan.

b) Promoting the Level II and Level III services

This water supply development program covers wide area and several Barangays or municipalities are connected by a water supply pipeline. The whole Samar province is divided into five or six service blocks. Spring and groundwater resources will be efficiently utilized to promote and expand the Level II and Level III services. The pipeline system will become the major water supply system by the end of the long-term development.

c) Technical development of the deep wells engineering

The water supply system with deep wells is usually provided to the area where there are no sufficient shallow groundwater and river water, such as coastal area. This program will contribute to the promotion and acceleration of deep groundwater utilization and deep well development, particularly in respect of hydrogeological investigation technology and engineering.

2) Strategy and objectives

Strategy and priority to set up the development program and target for the Master Plan are considered and described as follows:

a) Eradication of water-borne and water related diseases

The eradication of diseases associated with potable water is the primary purpose of the water supply development program. Outbreaks of diseases such as gastroenteritis, dysentery cholera, typhoid and hepatitis usually originate from the lack of adequate and sanitary water supply. Schistosomiasis is

infected in wide area of ponds, flooded fields, creeks, etc. Taking into account this condition, development of water supply and waste water treatment should be carefully conducted. The list of municipalities with population exposed to schistosomiasis are shown in Table J.2.1. The highly exposed areas indicated in this table shall be given high priority in the water supply development.

b) Improvement of living condition and promotion of industries

In general, the quality of life could be expressed or indicated by the water supply served population. The high service rate shows the better quality of living. The lack of adequate water supply and sanitation is the cause of disease and illness. The Philippine Water Supply Development Plan as well as the International Drinking Water Supply and Sanitation Decade under the United Nations, projected that the water supply served population will increase up to 75% by the year 1990. The average served population rate of 1987 stands at 23% in the Samar province. Therefore, high priority will be given to the lower-served area than the average area in the water supply development. (refer to Appendix J.2.2.)

c) Community needs and cooperation

Strong community needs and cooperation are the most essential factors to promote and implement the water supply project. The cooperation among the community and beneficiaries are particularly important for the smooth operation and maintenance of the water supply system. The project areas proposed in the capital investment program are as listed below:

- Level II and Level III Service Areas covered : Catbalogan, San Jorge, Gandara, Wright, Basey, Pinabacdao, Calbiga and other poblacions.

- Level I Service Area : Catbalogan and 337 Barangays

d) Alleviating the burden of water fetching

The Level I and Level II services require fetching of water from the outlet of the well or communal faucet. In the rural area, water fetching is usually done by women and children. However, in some municipalities in Samar province, it is done by men because of the long fetching distance. According to the Rural Water Supply and Sanitation Master Plan-1982, the average distance between wells and houses was projected to be 35 m. Since the actual distance ranges from 100 m and 1,000 m, the inhabitants are forced to do the heavy work of water fetching.

The primary objectives of the water supply development are; 1) to alleviate the burden of water-fetching, and 2) to take the advantages accruing from alleviation of burden for other productive activities. (refer to Appendix J.2.3)

3) Master plan and target

The development program was formulated based on the basic concept, strategy and objectives of the water supply development as described in the previous section. Fifteen (15) development projects were selected, and classified into three stages; namely, short-term, medium-term, and long-term development, according to priority in the comparative study. (refer to Appendix J.2.4) These development projects by stage are as listed below. (refer to Figure 5.4)

a) Short-term development

- The areas ranked as first priority in the comparative study are Basey, San Jorge, Gandara and Calbiga areas.
- The Calbayog city as the center of economy and industry in the Samar province.

b) Medium term development

The areas to be developed under the deep well development and evaluated as the second priority in the comparative study are Pinabacdao, San Sebastian and Pagsanghan areas. Further study on hydrogeology will be required.

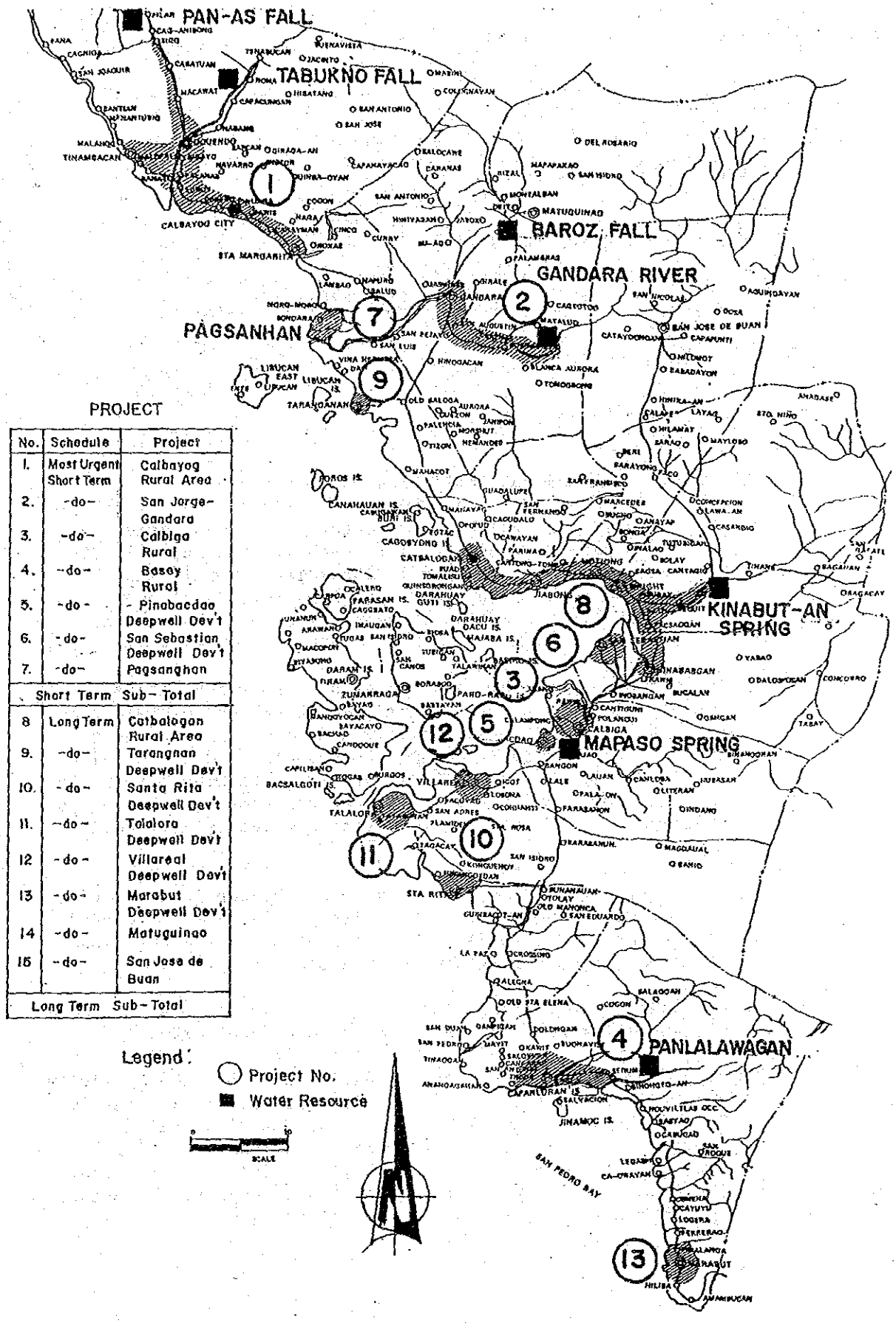
c) Long term development

The areas with less priority in the comparative study are Catbalogan, Tarangnan, Santa Rita, Talalora, Villareal, Marabut, Matuguinano and San Jose de Buan areas. Further study and evaluation will be required based on the progress of the implementation of the short-term development projects.

d) Target of water supply development program

The targets of the served population in this Master Plan are 293,300 or 53% of the total population for the medium-term development, and 526,900 or 85% of the total population for the long-term development, while the present served population rate is 23% only. Consequently, the targets both in the scheme of the International Water Supply and Sanitation Decade by the United Nations, and in the Rural Water Supply Master Plan by the Philippine government, will be attained by the end of the long-term development in the Samar province.

FIGURE 5.4. WATER SUPPLY MASTER PLAN IN SAMAR PROVINCE



PROJECT

No.	Schedule	Project
1.	Most Urgent Short Term	Calbayog Rural Area
2.	-do-	San Jorge-Gandara
3.	-do-	Calbiga Rural
4.	-do-	Basey Rural
5.	-do-	Pinabacdao Deepwell Dev't
6.	-do-	San Sebastian Deepwell Dev't
7.	-do-	Pagsanghan
Short Term Sub-Total		
8	Long Term	Catbalogan Rural Area
9.	-do-	Tarangnan Deepwell Dev't
10.	-do-	Santa Rita Deepwell Dev't
11.	-do-	Talalora Deepwell Dev't
12	-do-	Villareal Deepwell Dev't
13	-do-	Marabut Deepwell Dev't
14	-do-	Matuguinao
15	-do-	San Jose de Buan
Long Term Sub-Total		

5.6. Social Service Development

5.6.1. Health Service

1) Development objective

Health and medical facilities will be supplemented and strengthened especially in the rural area. Present health and nutrition status will be improved through strengthening the primary health care.

2) Strategy and target

a) Health and medical facilities and manpower

- The proposed hospital bed and doctor-population ratios in the short term development will reach 1:1,000 and 1:10,000 respectively at the current regional level, while the proposed ratios at the end of the long term development plan will reach 1:600 and 1:6,400 respectively at the current national level.

- The proposed Barangay health station-population ratios during the short and long term development period will reach 1:5,400 and 1:2,500 respectively under the criteria settled (minimum requirement) by DOH. Because the current service levels of region and the Samar province are higher than the national level and furthermore each three or four Barangays shall have a BHS in order to strengthen the primary health care.

- The nurse, midwife and sanitary inspector-population ratios of 1:4,500, 1:4,000 and 1:16,000 respectively are proposed at the end of the short term development and these ratios shall be maintained in the foreseeable future.

- The dentist-population ratio shall be maintained with the current ratio of 1:26,000. (refer to Appendix K.2.1)

- On the basis of the current condition such as no electricity supply in the rural area and not stable electricity supply in the urban area and Barangays along Maharlika Highway storage facilities of solar powered cold chain shall be provided for preserving medicines, materials of artificial insemination and so on at populated and geographical points in the short term plan.

b) Others

The other targets are shown as follows:

- To implement the program on comprehensive maternal and child health including nutritional, family planning and dental health.
- To implement technical training including Barangay health worker.
- To reduce schistosomiasis diseases.
- To improve environmental sanitation with introduction of quality water supply and to introduce sanitary toilet facilities.
- To strengthen information and research activities.

3) Development program and projects

Basic health service and efficient health care system including health, nutrition and personnel training shall be completed. The following programs and projects are proposed:

a) Health infrastructure programs

- Hospital bed in the Samar province is required to supplement 230, 400 and 870 beds at the short, medium and long term development, respectively. Existing hospitals are allocated at populated and geographical centers such as Catbalogan, the Calbayog city and Basey. In order to increase accessibility to the hospital, new hospital shall be established in other geographical centers. At the same time the existing hospitals are required to expand bed capacity and to introduce new equipment so as to form an efficient hospital system in the Samar province.
- The Barangay health stations (BHSs) of 190 is additionally required by the end of the long term development plan. Moreover, each Barangay shall be functional as "primary health care Barangay" by promoting health care delivery. The capital cost for construction by the government is no more needed, but only the cooperative efforts of local populace shall be required.
- 20 solar power cold chains would be provided at four geographical centers, four public hospitals and eleven rural

health units for preserving medicines in the short term plan. Among them, one facility will be furnished for Gandara Animal Breeding Center due to preserving materials of artificial insemination for promoting the animal husbandry industry.

b) Manpower development program

In order to compensate a shortage of the personnel for current and target years, additional professional manpowers such as 70 doctors, 50 nurses, 50 midwives, 20 dentists and 10 sanitary inspectors will be required.

In terms of the number of nurses and midwives, they are currently satisfied with the national standard, however, some nurses and midwives had moved from the rural to the urban area. Therefore, incentive measures shall be taken for them to be back including physicians in order to work in the rural area.

c) Comprehensive maternal and child health program

The program is composed of maternal and child care, expansion program on immunization, nutritional program, control of diarrheal disease for children aged zero to four, dental program and promotion of breastfeeding.

d) Training development

The program aims to develop health manpower with seminar and training in order to efficiently and effectively carry out health service delivery for all personnel.

e) Environmental sanitation

The emphasis of the program is given to the improvement of environmental sanitary condition, more sufficient sanitary garbage disposal, adequate drainage for polluted water, safe water supply and food sanitation.

f) Population information management and dissemination Program

The program promotes the acknowledgment of understanding and demand for programmed services through an extensive information system.

5.6.2. Education

The educational development programs are designed for school children of elementary and secondary schools, tertiary school students, the drop-outs, illiterate adults and applicants of vocational education.

1) Development objective

The following are the main objectives of the component.

- School facilities must be provided to cope with the needs.
- The quality in education and training must be improved.
- Educational opportunity will be provided for the drop-outs, unemployed and underemployed adults.

2) Strategy and target

a) School building facilities

The facilities of elementary and secondary schools will be provided to cope with the needs for each target year. In case of the tertiary school, the number of enrollees will be expected to increase numerously. Therefore, new tertiary schools (college level) will be established. (refer to Appendix K.2.2)

b) Quality of education and training

- New elementary school curriculum will be fully implemented with emphasis on the 3Rs and value education.
- Teachers and school administrators will be re-trained.
- Monitoring and evaluation will be established in order to improve the education system.
- Good qualified education shall be executed through the nationwide implementation of the Secondary Education Development Program (SEDP) which will be started in 1989.
- Skills required shall be promoted for agricultural and rural-based development such as fishery, livestock, processing and farm management.
- Agricultural and technical education shall be intensively promoted.
- Vocational education shall be introduced through the emphasis on basic managerial and business course.
- Development manpower course shall be proceeded for research and development.

c) Non-formal education

- The open school system shall be established for populace in the rural area.

- The scholarship system shall be continued and developed.

3) Development program and project

a) School building

The reconstruction and rehabilitation of classrooms for elementary and secondary schools may be enough to satisfy the future needs, because of many unusable classrooms under dilapidated condition at present.

In case of tertiary school (college level), three new colleges will be required at populated and geographical centers for increasing the capacity. Taking the agricultural and rural situation of the Samar province into consideration, the school types for these colleges will be studied further.

b) Curriculum development

The curriculum will be up-graded in the elementary and secondary schools including the policy and standards in science etc. The teaching and learning material will be developed and be adequately distributed.

c) Staff development

Academic and technical ability will be upgraded for elementary and secondary teachers, administrators, supervisors and office personnel, and the capabilities of planning, management and research also will be improved through the training.

d) Student financial assistance program

The grant scholarship system will be introduced for the poor students and may be expanded through additional financial assistance.

e) Research and development program

In order to form better policy and guideline for formal education, it must be proceeded that the effect and impact of educational program on training and curriculum development are researched and evaluated.

5.6.3. Housing

1) Development objective

The following are the main objectives of this component.

- Development of home-ownership of adequate houses for each income class.
- Provision of dwelling unit with supporting facilities of water supply, light and toilet for low income families.

2) Strategy

The strategy is shown as follows:

- To provide low cost housing for low income families
- To provide standard housing materials and module design system
- To provide incentive and government support to private housing developers
- To improve housing financial system that is integrating savings, mortgage and credit insurances in the medium and long term plan.

3) Development program and project

a) Social housing program

The social housing program is composed of the following three types of program.

- The rural resettlement program will be provided for deserving landless families with the end of view of improving their income and standard living through cooperation with the government.
- The urban resettlement program will be created for illegal inhabitants and displaced families in areas where there are possible employment opportunities.

- The site and infrastructure services of other facilities such as access roads, water supply, light facility etc. will be improved and upgraded for illegal areas in city and town propers.

b) Model farmhouse

In order to improve the living condition, model farmhouses as the demonstration will be constructed at populated and geographical centers of Gandara-San Jorge, Jamonini, Calbiga and Basey areas in the short term plan.

The model farmhouse which will be constructed with local cheap materials, has available space for animal husbandry breeding and planting cash income crops in the backyard and/or under the eaves, and furnishes storage facility for the agricultural input and output. Therefore the farmhouse will be able to bring improvement of cash income and the nutrition.

c) Economic and open market housing program

The economic housing will be provided for the families accommodated in obsoleted houses as well as newly emerging households belonging to middle and high income groups. (refer to Appendix K.2.3)

5.6.4. Communication

1) Development Objective

The objective of telecommunication is to provide facilities and efficient services extended with not only intra-region but also inter-region.

The primary object of postal communication in the postal infrastructure sector is the enhancement of the efficiency of the postal service by improving and expanding postal facilities and improving mail processing and delivery.

2) Strategy and target

a) Telecommunication

Almost all telecommunication equipment and buildings are old-fashioned and defective at present. The existing programs are proposed by Bureau of Telecommunication as follows.

National telephone program-trench 1-2, which will make a nationwide network for the communication needs of the whole country, will be started from 1988. Expansion program of telephone from 300 lines to 500 lines is proposed for Catbalogan.

The strategies are shown as follows.

- The radio station for non-service area will be provided within next five years.
- The wire telegraph station will be converted into radio stations within next five years.
- The national telegraph transfer services (NTTS) will be established in all municipalities until the end of the medium term plan.
- The existing telecommunication buildings will be repaired during the planning period for 20 years.
- The new telephone stations will be established or improved in populated areas and geographical centers.
- The telephone services will be expanded to all municipalities by the end of the long term development.

b) Postal communication

The strategies are shown as follows:

- The post offices will be established in all municipalities during the short term development.
- The rental offices and stations will be replaced with bureau-owned buildings within the short term development.
- In order to expand postal services, the postal station will be constructed in the rural area.

3) Development programmed projects

a) Telecommunication

The four proposed telegraph stations will be established for non-service areas of the Samar province during the short term development. The 28 national telegraph services stations will be established in all municipalities by the end of the long term development. The four new telephone stations will be established by the end of the medium term development. (refer to Appendix K.2.4)

b) Postal communication

The 26 bureau-owned buildings will be constructed for the Samar province during the short term development. The city post office will be established in the Calbayog city by the end of the short term development.

The 28 additional postal stations shall be established for Barangay in order to improve the service for Barangay in each municipal. (refer to Appendix K.2.4)

5.7. Cost Estimate

5.7.1. Estimation Condition

1) Unit cost

The unit cost was determined basing on the unit cost of similar work item used in the recent projects in the Samar province and Region VIII. Then all unit costs were updated to the price level as of June 1987 using the price index by category of construction in the industry sector, issued by NEDA. Each unit cost was further split up into local currency and foreign currency cost.

2) Exchange rate

The exchange rate between Philippine pesos and U.S. dollar was determined at 20.50 pesos (US$1.00 = 20.50 Philippine pesos).

3) Administration cost and contingency

Engineering and administration cost was considered as 20% of construction cost and physical contingency with 15% was also included in the development cost.

5.7.2. Development Cost

The total development cost at current price is estimated at 8,450 million pesos, of which 2,292 million pesos is for the short

Table 5.2. Summary of Development Cost at Current Price

(unit: 1,000 ₱)

Description	Total	Short-Term	Medium Term	Long Term
1. Agricultural Development	100,000	43,000	53,000	4,000
2. Small Scale & Cottage Industry Development	20,300	11,500	4,400	4,400
3. Infrastructure Development				
1) Irrigation and Drainage	1,539,200	170,800	397,400	971,000
2) Roads and Transportation	2,260,400	472,500	578,900	1,209,000
3) Mini-Hydropower	560,400	59,800	213,800	286,800
4) Rural Electrification	725,200	116,400	74,000	534,800
5) Rural Water Supply	825,400	346,200	43,500	435,700
Sub-Total of 3	5,910,600	1,165,800	1,307,600	3,437,300
4. Social Services Development				
1) Health Services	542,800	141,200	105,700	295,900
2) Education	267,500	81,000	63,000	123,500
3) Housing	897,500	226,200	226,300	445,000
4) Communication	148,500	60,600	69,000	18,900
Sub-Total of 4	1,856,300	509,000	464,000	883,300
5. ADPP	562,800	562,800	-	-
Total (1-5)	8,450,000	2,292,000	1,829,000	4,329,000
	(100%)	(27%)	(22%)	(51.6%)

Table 5.3. Summary of Annual Operation and Maintenance Cost

(unit: 1,000 ₱)

Description	Short Term (1988-1992)	Medium Term (1993-1997)	Long Term (1998-2007)
1. Agricultural Development	15,130	26,540	13,860
2. Small Scale and Cottage Industry Development	2,520	2,220	3,120
3. Infrastructure Development			
1) Irrigation and Drainage	800	2,690	8,350
2) Roads and Transportation	16,590	35,250	70,560
3) Mini-Hydropower	1,620	7,290	13,100
4) Rural Electrification	960	1,590	4,110
5) Rural Water Supply	3,500	4,220	8,260
Sub-Total of 3	23,470	51,040	104,380
4. Social Services Development			
1) Health Services	9,080	120,070	18,830
2) Education	5,030	9,340	13,800
3) Housing	-	-	-
4) Communication	7,810	19,400	24,300
Sub-Total of 4	21,920	40,810	56,930
5. ADPP	20,160	14,490	12,110
Total (1-5)	83,200	135,100	190,400

term development, 1,829 million pesos for the medium term development and 4,329 million pesos for the long term development. The summary of the project cost is shown in Table 5.2.

5.7.3. Operation and Maintenance Cost

The annual operation and maintenance cost is composed of salary and wages for O & M organization staff, administration and general expenditures, equipment depreciation and repair cost, fuel and oil cost, maintenance cost of the facilities and office facilities, special expenditure for training/seminar/demonstration programs, and about ten percent of the total O & M cost as physical contingency.

The annual operation and maintenance cost is amounted at 83.2 million pesos for the short term period, 135.1 million pesos for medium term period and 190.4 million pesos for long term period. The summary of the annual operation and maintenance cost is as shown in Table 5.3.

5.8. Implementing Program

5.8.1. Implementing Agency

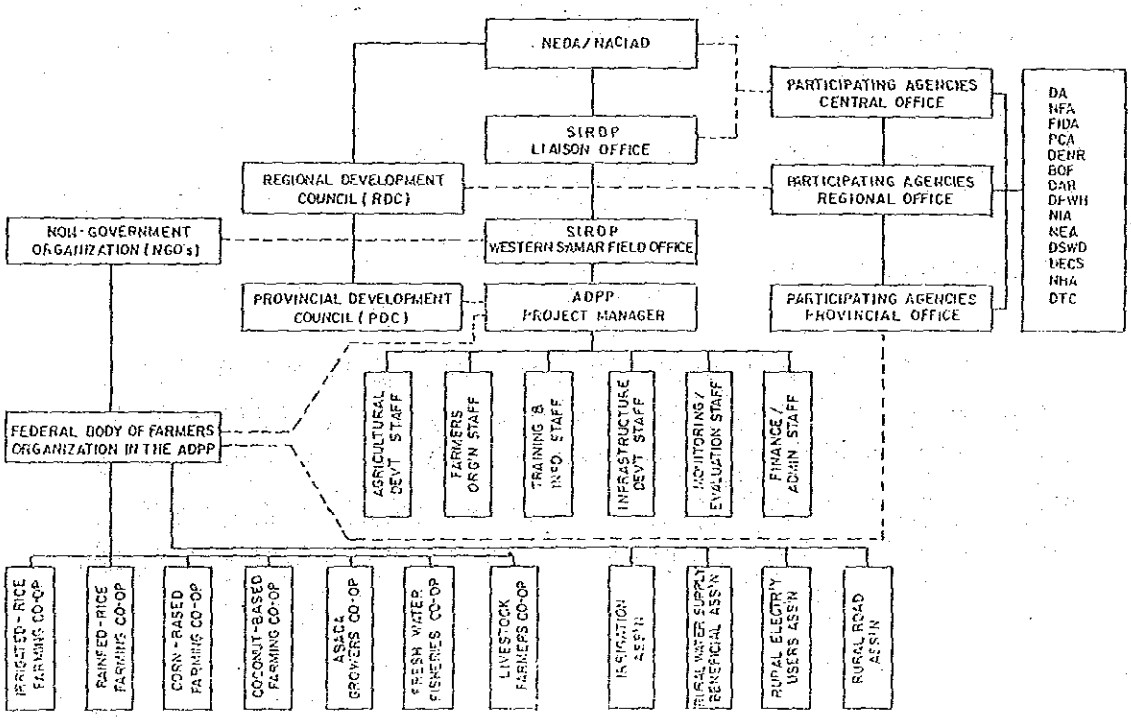
As the development project formulated in this master plan has covered serveral sectors, all sectoral agencies concerned must be essentially involved in the implementation of the Project. On the other hand, it is also strongly required that certain organization shall be appointed as a main implementing body in order to contribute to smooth and on-schedule implementation and to attain overall development target. Particularly such key agency shall have practical functions to act efficiently on the field of the project management and coordination among the sectoral line agencies.

Table 5.4. Implementing Agencies for Master Plan

CATEGORY	KEY AGENCY	SUPPORTING AND/OR RELATED AGENCY/BODY
1. Agricultural Development	DA	
(Rice based)	"	NFA, FIDA
(Corn based)	"	
(Coconut based)	"	PCA
(Livestock)	"	
(Fresh water fishery)	"	
(Agro-forestry)	DENR, BOF	
2. Small Scale & Cottage Industry Development	DTI	Private Sector
3. Infrastructure Development		
1) Irrigation and Drainage	NIA	NGO's LGU's
2) Roads	DPWH	LGU's
3) Mini-Hydropower	NEA	
4) Rural Electrification	NEA	SAMELCO
5) Rural Water Supply	DPWH	NGO's LGU's
	(Level I)	
	(Level II)	
	LUWA	" (Water District)
	(Level III)	
4. Social Service Development		
1) Health Service	DSWD	NGO's LGU's
2) Education	DECS	NGO's LGU's
3) Housing	NHA	DSWD
4) Communication	DTC	
Executive or Coordinating Agency	SIRDP NACIAD	

N.B. Excluded in the list are "Institute", "Center", "School" and "Project" typed organizations.

FIGURE 5.5. PROPOSED ORGANIZATIONAL SET-UP FOR IMPLEMENTATION



Under the above consideration, it is recommended that the key implementing agency of the development program would be the Samar Integrated Rural Development Project (SIRDP), which has sufficient experiences over ten years on the project management and coordination in the Samar island. On this basis, technical and close assistance to SIRDP shall be provided by all line agencies concerned such as DA, NIA, DPWH, LWUA, NEA, DTI, NHA, DECS and others as shown in Table 5.4 and Figure 5.5.

5.8.2. Schedule of Implementation

Implementation of the 20-year development project is divided into three phases, namely short term (1988-1992), medium term (1993-1997) and long term period (1998-2007). The summary of the investment schedule of the project cost by phase is shown in Table 5.2.

In order to implement the development project, financial and technical assistance by the foreign governments and/or the international development organization is hopefully to be rendered to the government of the Philippines. Particularly, since the total development cost has reached to the large amount, great efforts for fund procurement must be made by the government so as to achieve the development target without delay.

5.9. Financial and Economic Analysis

5.9.1. Basic Concept

Since the Project is intended for the fulfillment of the Basic Human Needs (BHN) for the inhabitants, it is quite difficult to evaluate the Project from the economic point of view, because the methodology to quantify the impact on BHN sufficiency has not yet internationally established; hence, the economic feasibility and

viability would hardly be anticipated. Therefore, the evaluations for private economy such as improvement of nutritional level and substantiality of farm budget should be more emphasized when compared with the evaluations on the national economy.

5.9.2. Methodology of Analysis

1) Financial analysis

To justify the financial viability of the project, the farm budget analysis under the present and the future situation was estimated from the viewpoint of private economy.

The 12 household models used in the financial analysis were selected from the typical farmers in the Gandara/San Jorge area, because this area was assumed as most economically depressed area as shown in Chapter 6 of this report.

The financial viability was evaluated as the increase of the family cash balance (disposable income) and the fulfillment of nutritional intake, because the Project will not improve the living standards of rural poor unless the farm households are able to generate the surplus cash for non-food expenditures coincided with the satisfaction of adequate dietary intake.

The procedure of the analysis is detailed in Section N.2.1 of Appendix I and 12 models are shown in Chapter 9 of Appendix II.

2) Economic analysis

The economic analysis was made in order to ascertain the feasibility of the Project from the standpoint of national economy. Since the medium term and long term development would be substantial after the realization of the short term development, the economic analysis was proceeded only for the limited project components of

the short term development. The irrigation development, the mini-hydropower development and the rural water supply development are only components which accrue the quantifiable benefits.

In the irrigation development, economic benefits per hectare were estimated on with and without project conditions, and EIRR was computed by unit project cost per hectare. Only direct irrigation benefits were considered in the analysis at full development. Projected cropping intensities, yields and prices, cost of paddy production and the imputed cost of farm labor were used in the economic analysis of the net value of production.

In case of mini-hydropower development, the project benefit was measured by considering alternative thermal plant construction. Projected amortization cost, operation and maintenance cost and fuel and lubricating oil cost of the thermal plant were used as the alternative benefit for the economic analysis. Computation of EIRR was made on 16 priority potential sites of the mini-hydropower development.

The water charge per gallon was computed on the six priority development, simultaneously monthly payment per household was calculated. Viability of the development plans was judged by the water charge, comparing the present charge in Level III service and that in priority water supply.

3) Analysis for unquantifiable projects

The quantifiable analysis was proceeded in such manner mentioned above, however in unquantifiable projects, the job creation number was shown as one of the numerical index for the project evaluation. Aside from the job creation number, socio-economic impacts are also considered as the benefit of unquantifiable projects.

5.9.3. Identification of Project Benefits

1) Non-quantified benefits

The Project has direct and undirect benefits which are not included in the estimation of the economic benefits. The following are defined as non-quantified benefit;

- The direct benefits from the road development projects were not quantified. The direct benefits called the normal and generated traffic benefits from road improvement projects and the development benefits from road construction projects are not significant, however the indirect benefits are substantial for the inhabitants.
- The increase in livestock production as a result of improvement in feed supply is not included in the project benefits. Some of the annual crop production will be used to manufacture indigenous livestock feeds.
- The other direct benefits which contribute rather to fulfillment of BHN than to national economy were not quantified.

2) Non-quantifiable benefits

Most of the project benefits from the short term development are categorized as non-quantifiable benefit. These are discussed below.

a) Enchancement of cooperation among farmers

Establishment of various projects requires inevitably farmers cooperation like the irrigators' association and the association for production or marketing, etc. Its organizational activities would strengthen the cooperative spirit among the farmers.

b) Maintenance of national security

Improvement in the living standards among the farmers would help reducing the regional disparity. This would significantly contribute to the maintenance of national security in the sensitive border area.

c) Activation for private sector

The incremental agricultural production is anticipated to contribute to the development of agriculture related industry and expansion of employment opportunities. It induces the monetary investment among the private sector.

5.9.4. Financial and Economic Evaluation

1) Financial evaluation

Crop budgets per hectare were prepared under the present and the future situations to reflect the production cost and returns. The production cost was estimated by crop as the total of cash costs and non-cash costs. Only cash costs were taken into consideration for farm budget analysis. (refer to Tables 5.5. to 5.6)

Livestock budgets were estimated likewise, as annual returns per head under the present and with project conditions, taking gross returns (including by-product) and costs of feed into consideration. Other costs are not considered because they consist primarily of family labor costs. (refer to Tables 5.7 to 5.8)

Crop returns per hectare under the with-project condition are expected to bring about much increase in comparison with that under the present condition. Similarly, returns from livestock are also improved.

The farm budget analysis of 12 household models are detailed in Chapter 9 of Appendix II. The attainment of final income target (57,193 pesos) is greatly dependent on increasing agricultural production including the livestock and acceleration for participation in the secondary and tertiary sectors. The number of available family labor will increase from 2.5 to 2.7 persons per family at the end of the long term development. It is difficult to expand the farm size due to little possibility of new reclamation.

The surplus family labor of about one person per family expected by modernization of farming practice shall be forwarded to the secondary and tertiary sectors in order to augment the family income from the off farm. Based on the result of the analysis, the desirable farming patterns by type of crop production were suggested. (refer to Appendix N.2.1 and N.2.4)

2) Economic evaluation

a) Irrigation development

Adapted paddy yield is 1.6 tons (without project) and 3.5 tons (with project) with cropping intensity 100% (without project) and 200% (with project). The construction period was assumed to be three years and the project cost to be distributed in first three years by 10%, 50% and 40%, respectively. The project life is 30 years including three years of construction period. Full development of the Project is expected to be attained three years after completion.

The irrigation development is economically feasible when the investment cost is less than 20,000 pesos per ha. In case that drainage facilities in the schistosomiasis infected areas are required and investment cost exceeds 50,000 pesos per ha, EIRR will be calculated at below 5%. The net incremental value of production per ha at full development was calculated at 3,020 pesos. (refer to Appendix N.3.3)

b) Mini hydropower development

The price of fuel and lubricating oil used as the alternative benefit is projected around 3.1 pesos per liter in 1997 constant price level which is about 1.5 times of that in 1987.

It is considered that mini-hydropower development can not be expected economically, and will not be able to provide the electric power at the cheaper price than that of SAMELCOs I and II. Among the 16 priority sites, Tagaoyang, Bugton, Calbiga, and Sohoton will be ranked as feasible project with EIRR of more than 12%. (refer to Appendix N.2.2)

c) Rural water supply development

To amortize the construction cost, 20 years were assumed as the repayment period and 10% of annual interest was considered. The construction period and the distribution of the construction cost is assumed as same as irrigation development. The grace period is taken by three years, therefore repayment begins from the fourth year to the 23rd year.

The present water charge in Level III system is around 0.05 pesos per gallon. Among the six priority projects, both Calbayog and Catbalogan Projects were computed the lowest charge around 0.06 pesos per gallon, which is nearly the same as the present water charge. On the other hand, Pinabacdao project was highest around 0.18 pesos per gallon. (refer to Appendix N.2.2)

d) Job creation number

The job creation number by sector and by target term was calculated by using the unit labor cost of 100 pesos which is about a double of the legal minimum wage rate in the rural area. The total man-years created by primary sector, secondary and tertiary sectors are 18,000, 30,000 and 30,000 which are scheduled in the short term, medium term and long term to 14,000, 19,000 and 45,000, respectively. It corresponds to the total income of about 1,940 million pesos in the labor force. (refer to Appendix N.2.2)

e) Overall economic evaluation

As mentioned before, the Project aims to contribute rather to salvation of rural poor through the fulfillment of BHN than to national economy. It could generate the idea that the reason why the existing economic entities have been abstained from the investment to the Samar province due to no financial and no economic returns to those entities, that is, by nature, dealt with in the financial and economic analysis.

It is no exaggeration to say that the Luzon proper enjoying many beneficial projects is no longer suffering from BHN aspects. For the future prosperity of the Philippines, however, the salvation of life especially on the rural poor is essentially required, and only through it that the activation of the national economy would be accelerated.

The economic sufficiency which the national economy will be given by the short term development is assumed through the computation of EIRR for the ADPP detailed in Chapter 9 of Appendix II, since the ADPP is considered as a specimen of the short term development. EIRR for the ADPP was computed at 6%, that entails the EIRR for the short term development of more or less 5%.

Table 5.5

Production Cost and Returns of Crops in Gandara-San Jorge Area

- Present and W/O Project Situation -

Item	Paddy (P/ha)	Corn (P/ha)	Coconut (P/ha)	Abaca (P/ha)	Mung been (P/ha)	Black Pepper (P/ha)	Cassaba/ Gabi (P/ha)	Pilinut (P/ha)	Sweet Potato (P/ha)	Vegetable (Green leafy) (P/ha)	Peaunt (P/ha)	Upland Rice (P/ha)
I. Cash Costs												
1. Farm Labor												
- Hired Farm Labor	60	40	40	40	40		40		180	40	40	60
2. Material Inputs												
- Seeds	90	58	420	125	130		240		250	160	600	207
- Fertilizer	115	198	-	722	-		1,905		715	563	-	284
- Pesticides/Chemicals	64	96	-	239	70		-		600	448	-	147
- Rodenticides	-	-	-	-	-		-		-	-	-	640
- Zinc	-	-	-	-	-		120		-	-	-	-
3. Interest												
- Interest on Loan	81	63	54	61	143		119		140	1	66	66
- Land Rental	190	200	100	190	190		190		190	190	190	190
- Land Tax	75	75	75	75	75		75		75	75	75	75
- Irrigation Fee	0	0	0	0	0		0		0	0	0	0
4. Sub Total	675	730	689	1,452	648		2,689		2,150	1,477	971	1,649
II. Non-cash Costs												
1. Unpaid labor (Family)												
- Seed bed Preparation	165	-	-	-	-		-		-	6	16	165
- Land Preparation	1,375	990	170	990	1,848		1,540		1,155	780	2,013	2,013
- Pulling & Terms-Planting	600	220	225	165	465		469		165	927	264	-
- Repair of Dikes	90	110	-	-	-		-		165	-	-	-
- Weeding	240	390	300	960	-		960		240	906	213	960
- Fertilizer Application	120	220	90	210	-		30		210	276	-	276
- Chemical Spraying	120	180	-	69	69		30		210	252	-	276
- Harvesting & Others	780	605	900	900	840		900		390	852	624	780
- Drying & Hauling	120	250	210	630	-		500		-	-	126	120
- Transportation & Others	60	90	240	90	-		170		253	21	90	138
2. Depreciation	140	25	90	47	21		47		21	39	12	140
3. Supplies/supplementary Foods	78	95	106	0	0		180		-	-	-	179
4. Interest on Capital Investment	41	13	108	41	29		24		29	110	14	13
III. Total Production Costs	4,604	3,918	3,128	5,554	3,729		7,539		4,988	5,646	4,343	6,709
IV. Total Returns	6,350	4,865	3,600	8,494	4,400		9,250		8,000	8,220	7,200	8,000
V. Returns above Cash Costs	5,675	4,135	2,911	7,042	3,725		6,561		5,850	6,743	6,409	6,351
VI. Cash Balance	1,746	947	472	2,940	671		1,711		3,012	2,574	2,857	1,291
VII. Profit Cost Ratio	0.38	0.24	0.15	0.53	0.81		0.22		0.60	0.45	0.66	0.19

- No Production - (Represented by Peanut -)

Source; Consultants' estimate using the following data

- "Food - Markets"- from Technology Resource Center, Manila
- "Cost of Production of Selected Agricultural Commodities" from Planning and Programming Division, Ministry of Agriculture
- Production costs of various crops from Bureau of Agricultural Statistics
- Farm economy survey conducted by Study Team

Table 5.6
Production Cost and Returns of Crops in Gandara-San Jorge Area
- W/ Project Situation -

Item	Paddy (P/ha) (Irrigated)	Paddy (P/ha) (Rainfed)	Corn (P/ha)	Coconut (P/ha)	Abaca (P/ha)	Mung been (P/ha)	Black Pepper (P/ha)	Cassaba/ Gabi (P/ha)	Pilinut (P/ha)	Sweet Potato (P/ha)	Vegetable (Green leafy) (P/ha)	Peaunt (P/ha)	Upland Rice (P/ha)
I. Cash Costs													
1. Farm Labor													
- Hired Farm Labor	120	60	40	40	80	40	825	40		180	180	180	180
2. Material Inputs													
- Seeds	450	225	164	840	187	130	1,650	240		1,250	160	415	207
- Fertilizer	1,344	672	297	198	1,083	245	245	1,905		1,715	563	245	672
- Pesticides/Chemicals	894	446	132	132	358	70	1,180	-		600	645	70	446
- Rodenticides	100	50	-	150	-	-	256	-		-	-	-	50
- Zinc	30	15	-	-	-	-	28	120		400	-	-	-
3. Interest													
- Interest on Loan	81	81	63	54	61	143	143	119		140	1	16	56
- Land Rental	380	190	200	100	190	190	190	190		190	190	190	190
- Land Tax	75	75	75	75	75	75	75	75	Represented by Peanut -	75	75	75	75
- Irrigation Fee	570	0	0	0	0	0	0	0		0	0	0	0
4. Sub Total	4,044	1,814	971	1,589	2,034	893	4,592	2,689		4,550	1,814	1,191	1,886
II. Non-cash Costs													
1. Unpaid labor (Family)													
- Seed bed Preparation	330	165	-	-	-	-	-	-		-	6	16	165
- Land Preparation	2,750	1,350	990	170	990	1,848	1,848	1,540		1,155	780	2,013	2,013
- Pulling & Terms-Planting	1,200	600	220	225	165	465	360	469		165	927	264	-
- Repair of Dikes	180	90	110	-	-	-	150	-		165	-	-	-
- Weeding	480	240	390	300	960	300	300	960		240	906	213	960
- Fertilizer Application	300	150	220	90	315	90	240	30		210	276	90	276
- Chemical Spraying	300	150	270	270	103	69	90	30		210	252	90	276
- Harvesting & Others	1,560	780	835	900	900	840	960	900		390	852	624	780
- Drying & Hauling	240	120	287	210	630	-	300	500		-	-	126	120
- Transportation & Others	120	60	90	240	90	-	420	170		253	600	90	138
2. Depreciation	140	140	25	90	47	21	47	47		21	39	12	140
3. Supplies/supplementary Foods	156	78	95	106	-	-	-	180		-	-	-	179
4. Interest on Capital Investment	41	41	13	108	41	29	41	24		29	110	14	13
III. Total Production Costs	11,841	5,778	4,516	4,298	6,275	4,555	9,348	7,539		7,388	5,983	4,743	6,946
IV. Total Returns	23,912	9,223	7,080	8,000	10,685	6,600	30,600	12,950		25,000	27,400	8,100	12,450
V. Returns above Cash Costs	19,868	7,409	6,109	6,411	8,651	5,707	26,008	10,261		20,450	25,586	6,909	10,564
VI. Cash Balance	12,071	3,445	2,564	3,702	4,410	2,045	21,252	5,411		17,612	21,417	3,357	5,504
VII. Profit Cost Ratio	1.02	0.60	0.56	0.86	0.70	0.45	2.27	0.71		2.38	3.58	0.70	0.79

Source; Consultants' estimate using the following data
- "Food - Markets"- from Technology Resource Center, Manila
- "Cost of Production of Selected Agricultural Commodities" from Planning and Programming Division, Ministry of Agriculture
- Production costs of various crops from Bureau of Agricultural Statistics

Table 5.7. Production Cost and Returns of Livestocks

(Present and W/O Project Situation)

Item	Carabao (₱/head)	Swine (₱/head)	Chicken (₱/head)	Duck (₱/head)	Goad (₱/head)
1. Farm Labor					
- Hired Human Labor	0	7	0	0	0
2. Feeding Material					
- Costs of livestock bought	2,772	170	8	25	60
- Feed/Supplement	832	484	20	40	125
- Veterinary/Medicine expenses	46	26	1	3	15
- Maintenance/repair	20	0	0	0	0
3. Interest					
- Loan repayment	451	43	0	0	11
- Other charges	222	0	0	0	0
4. Non-cash Costs					
- Unpaid labor (family)	375	120	4	6	49
- Supplies/supplementary food	370	23	0	0	11
- Depreciation	18	12	1	2	6
- Interest on capital investment	176	84	0	0	33
- Others	0	14	0	0	0
5. Total Production Cost (₱)	5,282	983	34	76	310
6. Total Returns (₱) 1/	7,887	1,219	36	81	372
7. Returns above Cash Costs (₱)	3,544	489	7	13	161
8. Cash Balance 2/	2,605	236	2	5	62
9. Profit Cost Ratio 3/	0.49	0.24	0.05	0.07	0.20

Note: Item 1. to 3. are cash costs

1/ Cash receipt from sales, consumed and total production cost.
2/ Total returns minus total cost.
3/ Cash balance divided by total production cost.

Source: Consultant's estimate using the following data.
- Farm economy survey conducted by Study Team
- Production Cost of Livestocks (Livestock and Development Council)

Table 5.8. Production Cost and Returns of Livestocks

(with Project Situation)

Item	Carabao (₱/head)	Swine (₱/head)	Chicken (₱/head)	Duck (₱/head)	Goat (₱/head)
1. Farm Labor					
- Hired Human Labor	0	7	0	0	0
2. Feeding Material					
- Costs of livestock bought	2,772	170	8	25	60
- Feed Supplement	832	484	20	40	125
- Veterinary/medicine expenses	46	26	1	3	15
- Maintenance/repair	20	0	0	0	0
3. Interest					
- Loan repayment	451	43	0	0	11
- Other charges	222	0	0	0	0
4. Non-cash Costs					
- Unpaid labor (family)	375	120	4	6	49
- Supplies/supplementary food	370	23	0	0	11
- Depreciation	18	12	1	2	6
- Interest on capital investment	176	84	0	0	33
- Others	0	14	0	0	0
5. Total Production Cost (₱)	5,282	983	34	76	310
6. Total Returns (₱) 1/	7,987 4/	1,219	36	86 5/	457 6/
7. Returns above Cash Costs (₱)	3,644	489	7	18	246
8. Cash Balance 2/	2,705	236	2	10	147
9. Project Cost Ratio 3/	0.51	0.24	0.05	0.13	0.47

Note: Item 1. to 3. are cash costs

1/ Cash receipt from sales, consumed and total production cost.
2/ Total returns minus total cost.
3/ Cash balance divided by total production cost.
4/ 100 pesos of increase can be anticipated accruing from rent of carabao as draft animal. (Viz. ₱ 20 x 5 days)
5/ As the ducks will be popular in G-S area, farm gate price will be considered to be higher at least five pesos.
6/ Farm gate price of goat in 1987 is averaged at 260 pesos in the Philippines, and 175 pesos in G-S area. Therefore, 85 pesos increase can be anticipated under with project situation.

Source: Consultant's estimate

CHAPTER 6. DEVELOPMENT OF PRIORITY PROJECTS

CHAPTER 6. DEVELOPMENT OF PRIORITY PROJECT

6.1. Priority of Development Component

The purpose of the Integrated Agricultural/Rural Development Project in Western Samar aims at increasing agricultural production, creating job opportunity and improving living conditions and uplifting living standards of inhabitants in the rural area. The final target is to fill up the gap between rural average and urban average by the target year 2007. The development plan would be set up by the three stages such as short term, medium term and long term. Staging of the development plan shall be made by applying certain criteria for giving priority on the development components.

Formulation of the Master Plan with well balanced development components shall be made by selecting priority projects from sectoral development components. The priority of the development components shall be given by the following considerations:

- Satisfaction of basic felt needs of the community,
- creation of employment opportunity including self-employment,
- provision of infrastructure for infrastructures,
- construction of infrastructure for production and
- most depressed areas.

Aside from the above-mentioned considerations, economic efficiency of the development investment and assessment of the impact to others in the Project Area shall be considered.

6.2. Program of Priority Development Component

Programing the priority development components in the Master Plan shall be made based on priority of the development in each component shall be given by the engineering consideration and social and economic effect to the Project Area.

The short term development is expected to implement urgently within five years so as to realize a quick yield of the development project with rather small amount of the investment. Programing the components in the short term shall be made based on selection of the top priority project of the development components.

The medium term development is scheduled to be implemented within ten year period to reach the economic and social level of the Philippine national average. Development components in the medium term shall be selected from the second priority of each component.

The long term development aims at lifting up the social and economic status of the Project Area to the average high level of the province in the country within 20 years period. Large amount of the development investment for the said long term development shall be required to realize remaining components of the Master Plan. Social and economic conditions after the implementation of the Master Plan shall be assessed by the progress of the implementation of the project components.

6.3. Agricultural Development and Promotion Project (ADPP)

6.3.1. Objective of ADPP

Agricultural Development and Promotion Project (ADPP) shall be established in the Samar province as a core of the implementation of the Integrated Agricultural/Rural Development Project for the development of the Project Area, promotion in agricultural productivity and improvement of the rural living.

In agricultural development, pilot facilities are quite useful as a demonstration for smooth introduction of new crops, new varieties and advance technology to take away anxiety of the conservative farmers for things new. It is necessary to develop the

Project Area by avoiding the said risks of the farmers and in parallel with this to establish a demonstration like ADPP. Pilot facilities are required as well for irrigation and drainage facilities, and farm-to-market roads as a show window for the entire Samar province.

6.3.2. Selection of the Project Area for ADPP

Areas of ADPP would be selected among the priority project areas in terms of agricultural productivity, social and economic conditions and rural development potential. Priority areas are, from the north to the south, the Jamonini area, the San Jorge/ Gandara area, the Calbiga area and the Basey area. Considering the effective means for the agricultural and rural development, central project of ADPP in a selected priority area shall be established while subprojects of ADPP shall be provided in other three priority areas.

As for selection of the areas for ADPP, location of the priority areas, social and economic conditions and agricultural productivity and potential are considered for the said criteria.

1) Location of priority area

Location of priority areas would be one of the significant factors in the selections of areas for ADPP. ADPP is a leading body as a core for the implementation of the integrated agricultural/rural development project. Catbalogan is capital of the Samar province located at the almost center of the province and the Calbayog city is located at the northern part of the province. Catbalogan and the Calbayog city are playing important roles in the province as the center of political and socio-economic activities. ADPP shall be kept in close relation to the provincial administration mainly of Catbalogan and the Calbayog city. The San Jorge/Gandara area is located at between the two cities and the first priority as the central project of ADPP shall be given.

2) Social and economic conditions

Comparative study on social and economic conditions for the selection of the ADPP area in terms of annual family income, tenure status, sharing arrangement, land holding status, municipal financial status, present status of irrigation and rural electrification are conducted. The Samar province is agriculture-oriented province and more than 80% of the households are engaged in agriculture. Therefore, social and economic conditions directly concerned with the Basic Human Needs would be considered the criteria in the selection of the ADPP areas.

As a result of the comparative study, the San Jorge/Gandara area would be given the first priority for the central project of ADPP and three other areas would be areas for subprojects of ADPP. (refer to Table 6.1)

3) Potential of agricultural production

Priority on potential of agricultural production is evaluated by the rate of increase in alienable and disposable land potential, agroforestry potential and the rate of increase in major food.

Non-cultivating lowland and hilly forest land suitable for agricultural cultivation has a big potential to be developed and utilized for the increase of agricultural production in the future. On the other hand, low agricultural productive area has also a big potential in leveling up the crop yield to get to the average of the national level.

As a result of evaluation on potential of agricultural production, the San Jorge/Gandara area shall be the first priority area as the central project of ADPP and the three other areas shall be the subprojects of ADPP. (refer to Table 6.2)

6.3.3. Components

ADPP to be implemented as a demonstration of the integrated agricultural and rural development consists of agricultural development, agricultural facilities development, development of post harvest and marketing service assistance, development of farmers' organization and establishment of Agricultural Development and Promotion Center (ADPC). Breakdown of the components are described as follows: (refer to Appendix II)

1) Agricultural development

a) Rice-Based Farming Development

- Irrigated rice-based farming: 2 places 25 ha each
- Rainfed rice-based farming: 2 places 10 ha each

b) Corn-Based Farming Development: 2 places 10 ha each

c) Coconut-Based Farming Development: 2 places 15 ha each

d) Abaca Development: 2 places 15 ha each

e) Hillside Farming/Agroforestry Development: 2 places 10 ha each

f) Livestock Development:

- Gandara Animal Breeding Center: existing
- Animal Diagnostic and Treatment center: 1 place
- Carabao Dispersal Module: 2 Brgys 11 heads each
- Goat Dispersal Module: 2 Brgys 25 heads each
- Duck Dispersal Module: 2 Brgys 50 heads each

g) Nursery Development

- Gandara Seed Farm: existing
- Nursery Station: 2 places
- Crop Protection Observation Stand: 4 Places

h) Freshwater Fishculture Development

- Freshwater Fish Hatchery Station: 1 place
- Backyard and Rice-fishculture: 2 Brgys

2) Agricultural facilities development

a) Irrigation Development

- Gravity Irrigation Area: 4 CISs, total 205 ha
- Pump Irrigation Area: 2 PIPs, total 250 ha

b) Drainage Development

- Drainage with Irrigation:	3 areas, total 195 ha
- Drainage of On-farm:	7 areas, total 115 ha

c) Rural Road Development

- Improvement/Upgrading Road:	12 km
- Rural Road:	27 km with 5 bridges
- Trunk Farm Road:	6 km with 1 bridge

d) Rural Water Supply Development

- San Jorge/Gandara Water Supply System:
  Service population 11,259
  Daily max. demand 1,043 m^3
  Transportation pipeline 20km

e) Rural Electrification

- Energize: 15 Brgys, 830 households
  Distribution line 30.3 km
  Secondary line 10.5 km

f) Rural Health Development
- Solar Powered Cold Chain: 4 places

g) Development of Farmhouse
- Model Framhouse: 2 houses

3) Development of post harvest and marketing service assistance

a) Post Harvest
- Pedal/Small Scaled Power Threshers and Power Corn Shellers
- Multi-purpose Dry-pavement and Mechanical Dryer
- Small Scaled Rice Mill
- Coconut Dryer, Charcoal Kiln and Chain/Disc Saw

b) Marketing Services Assistance
- Marketing research Assistance
- Tracks
- Meat Cold Storage

4) Development of farmers' organization

- Beneficiary Farmer's Organization for O & M
- Cooperative Managerial Organization for Demonstration Farms and Agricultural-related Programs

5) Agricultural Development and Promotion Center (ADPC)

- Office for managing all Activities of ADPP
- Workshop and Garage of Agricultural Machineries
- Laboratory for Soil Analysis and Inoculants and Seed Analysis
- Training and Extension
- Rural Health Unit
- Agricultural Meteorological Station
- Others

6.3.4. Implementation of ADPP

Implementation of ADPP shall be started prior to the implementation of the Integrated Agricultural/Rural Development Projects as a demonstration window of the development in the Samar province.

ADPP shall be implemented by SIRDP in close cooperation with the beneficiaries concerned. Participative activities of the beneficial people in the implementation is a means of successful implementation of ADPP. Operation and management of ADPP after completion of ADPP facilities shall be undertaken by the beneficiaries themselves under supervision and guidance by SIRDP.

It is expected to receive the particular financial support from certain foreign country/international agency for the implementation of ADPP for smoothly and effectively giving impact on the agricultural/rural development to the entire Samar province.

Table 6.1. Priority on Social/Economic Conditions Among Priority Project Areas

Priority Project Area	Annual Family Income (Table 6.3)	Tenure Status (Table 6.4)	Sharing Arrangement (Table 6.5)	Land Holding Status (Table 6.6)	Municipal Financial Status (Table 6.7)	Present Status of Irrigation (Table 6.8)	Rural Electrification Ratio (Table 6.9)	Total of Orders
San Jorge/Gandara	1	2	1	1	3	1	1	10
Jamonini	4	1	2	4	1	4	3	19
Calbiga	2	3	2	2	4	2	4	19
Basey	3	4	2	3	2	3	2	19

Table 6.2. Priority on Potential of Agricultural Production Among Priority Project Areas

Priotity Project Area	Rate of Increase in A & D Potential	Agro-Forestry Potential	Rate of Increase in Major Foods	Total of Orders
San Jorge/Gandara	4	3	4	11
Jamonini	1	1	2	4
Calbiga	3	4	1	8
Basey	2	2	3	7

Source : Table 6.10 in this Report

Table 6.3. Annual Family Income and Expenditure in Priority Project Areas

Priority Project Area	Number of Samples Farmer	Annual Family Income Amount Peso	Annual Family Income Order by Priority	Annual Expenditure Peso
San Jorge/Gandara	30	17,180	1	16,321
Jamonini	30	28,164	4	26,755
Calbiga	10	19,068	2	18,115
Basey	10	20,883	3	19,839

Source : Farm Economy Survey conducted by JICA Study Team (1987)

Table 6.4. Tenure Status in Priority Project Areas

Priority Project Area	Category of Land Ownership	Number of Tenant	Percentage of Tenant		Order by Priority
			(%)		
San Jorge/Gandara	Full Owner	61	34.6	77.8	2
	Part Owner	76	43.2		
	Tenant	39	22.2		
	Total	176	100.0		
Jamonini	Full Owner	41	27.3	65.3	1
	Part Owner	57	38.0		
	Tenant	52	34.7		
	Total	150	100.0		
Calbiga	Full Owner	25	75.8	78.8	3
	Part Owner	1	3.0		
	Tenant	7	21.2		
	Total	33	100.0		
Basey	Full Owner	70	49.0	100.0	4
	Part Owner	73	51.0		
	Tenant	0	0		
	Total	143	100.0		

Source : Farm Economy Survey conducted by JICA Study Team (1987)

Table 6.5. Sharing Arrangement between Landowner and Tenant in Priority Project Areas

Priority Project Area	Sharing Arrangement (Landowner VS Tenant)		Order by Priority
	(%)		
San Jorge/Gandara	25	(25:75)	1
Jamonini	20	(20:80)	2
Calbiga	20	(20:80)	2
Basey	20	(20:80)	2

Source : Farm Economy Survey conducted by JICA Study Team (1987)

Table 6.6. Land Holding Status in Priority Project Area

Priority Project Area	Land Use Category	Land Holdings	Average Land Holdings (Ha)	Average Total Land Holdings	Order by Priority
San Jorge/Gandara	Paddy Field	Owned	0.3	2.5	1
		Tenanted	0.8		
	Upland Field	Owned	0.4		
		Tenanted	0.5		
	Orchrd/ Tree Crops	Owned	0.2		
		Tenanted	0.3		
Jamonini	Paddy Field	Owned	0.7	4.1	4
		Tenanted	0.6		
	Upland Field	Owned	0.2		
		Tenanted	0.6		
	Orchard/ Tree Crops	Owned	1.4		
		Tenanted	0.6		
Calbiga	Paddy Field	Owned	0	3.1	2
		Tenanted	0		
	Upland Field	Owned	2.5		
		Tenanted	0.1		
	Orchard/ Tree Crops	Owned	0.5		
		Tenanted	0		
Basey	Paddy Field	Owned	1.7	3.5	3
		Tenanted	0.3		
	Upland Field	Owned	0		
		Tenanted	0		
	Orchard/ Tree Crops	Owned	1.4		
		Tenanted	0.1		

Source : Censuses of Agriculture (1985) and Farm Economy Survey conducted by JICA Study Team (1987)

Table 6.7. Municipal Financial Status in Priority Project Areas

Priority Project Area	Municipal Income Per Capita (Peso)	Municipal Expenditure Per Capita (Peso)	Order by Priority
San Jorge/Gandara	46.3	32.5	3
Jamonini	--	6.3	1
Calbiga	43.3	160.5	4
Basey	29.8	32.5	2

Remarks : Amount in San Jorge/Gandara Area is an average of Gandara Municipality

Source : NEDA Region VIII (1984)

Table 6.8. Present Status of Irrigation in Priority Project Area

Priority Project Area	Irrigated Paddy Field Ha	Rainfed Paddy Field Ha	Rainfed Upland Paddy Ha	Total Ha	Ratio of Irrigation %	Order by Priority
San Jorge/Gondara	40	2,829	300	3,169	1.3	1
Jamonini	760	3,353	540	4,653	16.3	4
Calbiga	40	393	200	633	6.3	2
Basey	120	1,042	300	1,462	8.2	3

Remarks : Acreage shows annually harvested paddy

Source : Social Provincial Profile, Western Samar (1986)

Table 6.9. Rural Electrification Ratio in Priority Project Area

Priority Project Area	Electrification Ratio %	Order by Priority
San Jorge/Gandara	10.1	1
Jamonini	25.6	3
Calbiga	27.7	4
Basey	17.5	2

Source : Social Provincial Profile, Western Samar (1986)

Table 6.10. Comparative Analysis on Potential of Agricultural Production in Priority Project Areas

Priority Project Area	A & D Land (1) km^2	Existing Cultivated Land (2) km^2	A & D Potential (3)=(1)-(2) km^2	Order by Priority	Agro-Forestry Potential Acreage(4) km^2	Order by Priority	Yield of Rice Per Ha(5) Ton/Ha	Order by Priority
San Jorge/Gandara	1,053	155	898	4	233	3	1.09	4
Jamonini	677	375	302	1	164	1	1.68	2
Calbiga	855	159	696	3	246	4	1.85	1
Basey	721	233	488	2	196	2	1.40	3

Source : (1) : 1986 Annual Report, BFD
(2) : 1980 Census of Agriculture, NCSO
(4) : Proposed land use (Master Plan)
(5) : 1985/86 Crop Production Data, BAS