

3) Distribution pipeline

Except San Jorge and Gandara poblacions, the distribution pipeline is branched off from the transmission pipeline to all the proposed Barangays. The above two poblacions are supplied by branching the distribution pipeline from San Jorge and Gandara distribution reservoirs. The distribution reservoirs will be effectively functional to meet the daily peak water consumption in the rural area. The reservoirs are located at the mountainous site with an elevation of 39 m in San Jorge reservoir and 23 m in Gandara reservoir in considering hydraulic water levels. The proposed concrete reservoir capacities for San Jorge and Gandara are 260 m³ and 220 m³, respectively. The distribution pipeline is provided for all service Barangays and is connected to the public faucet or community faucet. The pipeline with 150 to 50 mm in diameter has a total length of 13 km. The total number of faucets is estimated at 300.

3.4.4. Operation and Maintenance

The beneficiaries association in collaboration with ADPC should be established for the operation and maintenance of the water supply facilities. The water charge will be imposed on the basis of the amount of water measured by a water meter attached to the faucet instrument and collected for a fund of operation and maintenance of the facilities. The chlorination process protects beneficiaries from water borne diseases which is caused by pollution and contamination of water. At the same time, processed water will be able to decrease a number of schistosomiasis cases prevailed in the ADPP area, because the beneficiaries would not be exposed to infection by bathing, drinking, washing, swimming, etc. This chlorination process facility is set up at the receiving well at the San Jorge reservoir, which is operated through testing the residual chlorine concentration.

3.5. Rural Electrification Development

3.5.1. Present Condition

The ADPP area is covered by SAMELCO I, however, only the Barangays situated along the national highway have been energized except Barangays of La Paz and Bulao that were energized very recently by SAMELCO I. All other interior Barangays have not received any electric power services, hence the kerosene lamps are most widely used source of light in these areas.

The existing distribution line has been extended to the ADPP area along the national highway from the Calbayog substation that is only substation managed by SAMELCO I. The Calbayog substation receives electric power by 69 kv transmission line from the Wright substation operated by SAMELCO II. In the project area, at present 10 Barangays out of 27 or 1,439 households out of 2,516 have been covered by the distribution line of either three phase (3 ϕ , 13.2 kv) or single phase (1 ϕ , 7.62 kv) with total length of 19.3 km.

It is essentially needed to energize interior Barangays not only to improve livelihood of inhabitants but to meet requirement of development scheme in the area.

3.5.2. Development Plan

The proposed distribution line is planned to extend from the existing distribution line to the interior Barangays to energize. The alignment of the proposed distribution line is selected along the road both existing and proposed, with consideration of easy construction and maintenance.

The total length of the proposed electric line is estimated at 30.3 km of the distribution line and 10.5 km of the secondary line to serve 15 Barangays with around 830 house-holds. After completion of ADPP, therefore, 25 Barangays out of 27 or 2,265 households out of 2,516 will be totally covered by the electric power services (refer to Tables 3.5.1 and 3.5.2).

Table 3.5.1. Present Situation and Development Plan of Electrification in ADPP Area

Item	Gandara	San Jorge	Total	Remark
No. of Barangays	7	20	27	
No. of Household Population	1,107	1,409	2,516	
<u>Existing Electric Line</u>				
No. of Barangays	4	6	10	
No. of Household Population	892	547	1,439	
<u>Distribution Line</u>				
3 ϕ (km)	4.9	11.6	16.5	
1 ϕ (km)	-	2.8	2.8	
Secondary Line (km)	Data not available			
<u>Development Plan</u>				
No. of Barangays	2	13	15	
No. of Household Population	92	734	826	
Distribution Line (km)	3.2	27.1	30.3	
Secondary Line (km)	1.0	9.5	10.5	

Table 3.5.2. Rural Electrification Development Project

No.	Place	Distribution Line			Secondary Line		
		No. of Consumers	Length of Line (km)	Phase	Size of Conductor	Length of Line (km)	Size of Conductor
<u>(Gandara Area)</u>							
E-1	San Agustin-Hinogacan	48	2.0	3 ϕ	#1/0 ACSR	0.5	#4 ACSR
E-2	Hinogacan-Pologon	44	1.2	1 ϕ	#4 ACSR	0.5	#4 ACSR
	Sub Total	92	3.2			1.0	
<u>(San Jorge Area)</u>							
E-3	Erenas-San Juan	70	0.8	1 ϕ	#4 ACSR	1.0	#4 ACSR
E-4	San Jorge-Manbon	18	0.2	1 ϕ	#4 ACSR	0.5	#4 ACSR
E-5	La Paz-Puhagan	61	2.1	1 ϕ	#4 ACSR	1.0	#4 ACSR
E-6	Bulao-Buenavista	102	2.3	3 ϕ	#1/0 ACSR	1.0	#4 ACSR
E-7	Buenavista-Himay	42	3.1	1 ϕ	#4 ACSR	0.5	#4 ACSR
E-8	Himay-Blanca Aurora	93	1.0	1 ϕ	#4 ACSR	1.0	#4 ACSR
E-9	Blanca Aurora-Tomogbong	53	2.5	1 ϕ	#4 ACSR	1.0	#4 ACSR
E-10	Buenavista-Ranera	51	4.1	1 ϕ	#4 ACSR	1.0	#4 ACSR
E-11	Aurora Nabuhay-Canyaki	26	2.0	3 ϕ	#1/0 ACSR	0.5	#4 ACSR
E-12	Quezon-San Isidro	18	3.0	3 ϕ	#1/0 ACSR	0.5	#4 ACSR
E-13	San Isidro-Rawis	21	1.2	1 ϕ	#4 ACSR	0.5	#4 ACSR
E-14	Rawis-Cantaguic	52	2.0	1 ϕ	#4 ACSR	1.0	#4 ACSR
E-15	San Jorge-La Paz/Bulao	127	2.8	3 ϕ	#1/0 ACSR	-	-
	Sub Total	734	27.1			9.5	
	Total	826	30.3			10.5	

3.6. Rural Health Development

3.6.1. Present Condition

Maternal, child and infant mortality rate is a big national concern and problem. National statistics show that maternal death per 100 live birth is 0.9, 4.7 death per 1,000 population at the age of 1-4 years and 54 deaths per 1,000 live births. Pneumonia, measles, diptheia, tetanus, polio, malnutrition, etc. are the primary killer disease. The situation is more serious in the rural areas like Samar. Hence, the government has placed emphasis on the immunization of children and Department of Health launched the Expanded Program on Immunization (EPI).

Schistosomiasis infection is also one of significant aspects in the rural health in the Samar province. According to the field investigation in the Samar province as of 1986, 164 Barangays in 11 municipalities and Calbayog City or 2,467 ha in total were affected by Schistosomiasis. The total number of colony and number of Schistosomiasis cases are 307 and about 57,000 persons under the medical prescription by IBRD. The effectiveness of the medical control program, specially in rural areas where it is most needed, is being hampered by the problem of preserving the potency of the vaccines from the time it is purchased from the manufacturer up to the time that it is to be administered to a child in the more remote Barangays.

3.6.2. Objective

The protection of vaccines against damaged and decreased potency requires that they be maintained at or below stipulated temperature (usually below 8°C) from the moment of manufacture to the point of injection into the child or adult. This range of temperature control is described as the cold chain. This cold chain includes storage at the manufacturer's facility, shipment to and

storage at the national warehouse, transport to and interim storage and regional vaccine center delivery to the Integrated Provincial Health Office, to district hospitals, and storage there until they are used.

Presently the weakest link in the cold chain is the storage at the rural health center or dispensary. There are two major reasons for this weakness:

- Refrigeration is not available in rural health centers,
- The system which is available is not reliable.

3.6.3. Facilities for Rural Health Development

Development plan as proposed is facilities of solar powered cold chain for safe storage of medicines, materials of artificial insemination and so on. Four sites of the proposed solar powered cold chain in the ADPP area are selected based on the proposed integrated development program of ADPP as follows:

- Gandara District Hospital
- Blanca Aurora Health Unit
- Gandara animal Breeding Center
- Agricultural Development and Promotion Center (ADPC)

The set of solar power cold chain consists of solar panel, regulator, battery bank, refrigeration/freezer unit, wiring system, and equipment housing.

3.7. Development of Farmhouse

Almost 80% of the households in the rural area have roof of light materials such as nipa, veneer and bamboo while 20% of that is with strong materials such as galvanized iron, concrete, brick, asbestos, etc. Specifically, farmers' houses in the ADPP area are mostly is small size and made up of light materials.

Agricultural development for ADPP includes not only increase of crop productions but also livestock development, backyard fisheries development, etc. Livestock development consists of improvement of development of facilities, Carabao dispersal module, goat dispersal module, duck dispersal module, etc. The development scheme of animal dispersal is expected to develop for side works of farmers' house wives and to earn some additional income. As for successful achievement of farmers' housewives, a model farmhouse shall be provided with comfortable living atmosphere and also the combined for convenient of such works of housewives.

For demonstration on this improvement, a model farmhouse would be constructed in the ADPP area for trial of the future farmhouse development (refer to Figure 3.7.1).

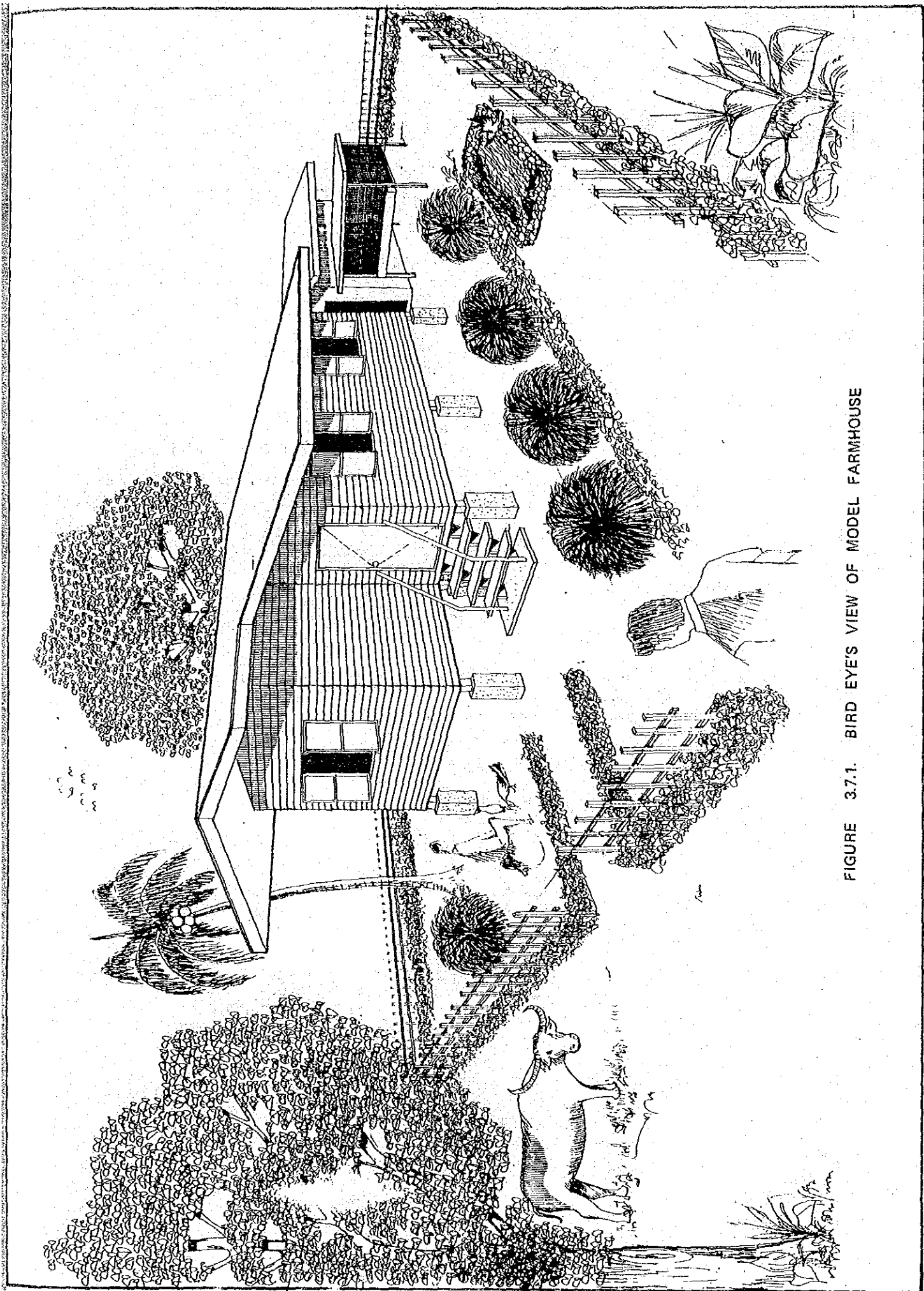


FIGURE 3.7.1. BIRD EYES VIEW OF MODEL FARMHOUSE

CHAPTER 4. POST-HARVEST AND MARKETING SERVICES
ASSISTANCE

CHAPTER 4. POST-HARVEST AND MARKETING SERVICES ASSISTANCE

The development of agri-business opportunities within the Barangay and municipal based cooperatives through development of the post-harvest and marketing facilities is considered as one of priority programs of the project.

4.1. Post-Harvest

Presently, few mechanical post-harvest facilities are used in the ADPP area, although some manual wooden threshers and winnows are used for paddy and corn by limited farmers. The sun drying on paved roads are very common.

Taking into account the present and future conditions in the Project area, the following improvements on the post-harvest practices are proposed;

- Pedal threshers or small scaled power threshers for rice milling shall be introduced in the Rice-based farming system demonstration area. In the Corn-based farming system demonstration area, power corn shellers could be used as seen in San Jorge at present.
- As seen in some Barangays, the concrete paved Barangay roads or multi-purpose dry pavements are effectively used for sun drying of grains. Currently, the construction of the multi-purpose dry-pavement is promoted by the Government. For the supplemental use of grains sun drying, the effect to introduce mechanical dryers for group-use have to be tested in the Rice-based and Corn-based farming demonstration areas.
- For the increased paddy production under the Project, the rice mill capacity should be expanded. For this, the small scaled rice mill like the one pass combined type with husker which has the milling capacity of 600 to 900 kg per hour shall be tested for the group use of farmers' organization.
- To improve the coconut post-harvest technology, improved coconut dryers and a charcoal kiln will be introduced in the Coconut-based farming system demonstration area for

the trial use among the coconut farmers' group. Also the trial use of chain/disc saws is recommended for the group use.

4.2. Marketing Services Assistance

The marketing services assistance includes the following three sub-components; viz. i) Marketing research assistance, ii) provision of 2.0 ton trucks to production-related farmers organization, and iii) lending of meat cold storage facilities to retailers. Besides, the propagation of marketing knowledge to the farmers and college students are to be promoted through ADPC.

The marketing research, defined as gathering, recording and analyzing of all facts about the problems relating to the transfer and sale of farm products from farmers to consumers shall be done together with the established farmers' organizations and SIRDP in technical collaboration with the marketing staff from DA, NFA, DTI, NACIDA, and so on. The major components required for marketing research is summarized as i) farm production studies, ii) consumer studies, iii) market analysis, iv) advertising studies, and v) evaluation of sales organization and operation. The SIRDP shall provide the organizations with proper information and advice concerning the marketability of the agricultural output, cooperative use of transportation and storage facilities, improvement and maintenance of retail shops and so on.

The provision of 2.0 ton trucks to production-related farmers organizations would eliminate the intervening margin and simplify the introduction of farm input, consequently, bring about the increase of farm gate price of farm production. As the result of elimination of intervening margin, the farm gate price of paddy, corn and copra will increase at least 0.3 pesos, 0.3 pesos and 1.0 peso per kg, respectively. The trucks should be managed and maintained by each organization.

The three sets of cold storage facilities for livestock meat (capacity: 12,000 liters each) are provided to ADPC, which are lent to retailers of San Jorge and Catbalogan market at the reasonable charge. It will benefit not only the farmers but also the retailers through the increase both the farm gate price and the market price, viz; the market price of livestock meat which has diurnal fluctuation due to lack of refrigerator will be stabilized and the farmer can supply their livestock meat not only in the early morning but also in the evening without risk by provision of refrigerant facility.

In 1987, enrollment of SNAS was 39, the bulk of students is from the adjacent municipalities because of its location, the facilities for education and, especially, the opportunities for marketing studies are not sufficiently provided. Therefore, marketing education to SNAS students as well as farmers will offer the provision of educational opportunities and propagation of accurate knowledge of the ADPP area, consequently, will lead to augmentation of farm income.

CHAPTER 5. FARMERS' ORGANIZATION DEVELOPMENT

CHAPTER 5. FARMERS' ORGANIZATION DEVELOPMENT

5.1. Preamble

To ensure success of any integrated rural development project, careful attention must be focused at formulation of suitably designed strategy and well-planned tactics for community organizing, so that active and sustained involvement of the community would be secured all through the stages of the development process. To achieve this end, every component of the Project should be directed at the satisfaction of the beneficiary farmers' felt-needs; it should be so coordinated with other components that the community would be given the maximum degree of satisfaction not only in obtaining a decent share of material benefits but also in direct participation in those activities which would have brought about such benefits.

Essential prerequisites which need to be met at the very beginning of the farmer organizing is to provide the farmers with pragmatic spring-boards for letting them take-off onto the higher levels of production and/or livelihood. Provision of socio-economic infrastructures which they, as their direct beneficiaries, will have to operate and maintain by themselves may be one way. Furnishing of the agricultural tools, implements and machinery and farm-inputs with which they can afford to launch upon such activities that would result at an enlarged reproduction of their favorite crops and the consequential better living in the near future may be another. This is the strategy which has been adopted for community organizing campaign under the Project.

Under this Project, the farmers cultivating the land which would be designated as demonstration farms, two each for (i) irrigated rice; (ii) rainfed rice; (iii) corn; (iv) coconut and (v) abaca, are encouraged to organize themselves into each independent

Cultivators' Group (CG). Under the Project, the necessary means and materials for an increased production of each crop specified for every demonstration farm would be provided with these organized farmers under the terms and conditions as specified in the below:

- each member of the CG should make post-harvest repayment of the equivalent price of the productive input materials which they would obtain as credit in kind in pre-planting season; and
- every CG should amortize the project-provided tools, implements and machinery during their respective periods of time as estimated for their wear and tear, so that they could be replaced with new sets (together with spare parts) at the end of their economic life.

The ultimate aim of this strengthening of capability of the CG which will be organized on the basis of each demonstration farm is to serve as the foundation for a cooperative undertaking that will involve the members in self-help development and in building service structure in support of its members' economic activities, preferably on each Barangay basis. However, this would take a considerable time during which the constituent members of the group will have to accumulate enough experiences in cooperative operation and management. Indeed, the Multi-Purpose Cooperative (MPC) is the most logical set-up to be organized at the municipal level in relation to the needs and economic activities of the farmers.

In utter absence of such MPC either municipal-wise, provincial-wise or region-wise, every effort should be exhausted on behalf of the demonstration farm-based CGs (until each one of them will grow up into strong MPC by itself) in establishing in the Project area a cooperative setup which could functionally substitute in a single body the three kinds of Municipal or Provincial Cooperative Federations each dealing with banking, marketing and education/training, respectively.

The MPC which would have as its affiliated members the demonstration farm-based CGs in the Project area should provide them with the essential services in the three inter-related cooperative activities of banking, marketing, and education/training. The banking services would comprise the provision of cash loan to the Project area's farmers through their CGs to pay for labor wages and other miscellaneous expenses required in planting as well as harvesting, and receiving of the savings and deposits on behalf of the affiliated Groups and their membership. The marketing services include the bulk procurement of both the producer- and consumer-goods for distribution among the Group members, and the collective marketing of their farm produce. Lastly, the education/training services are made up of the dissemination of cooperative principles and trainings on the methodology of cooperative operation/management including such technical aspects as of the sound accounting system and accurate bookkeeping practices, so that the reliable financial statements could periodically be prepared for auditing purpose in view of identifying the economic standings of each of its member-Groups.

CGs which would be organized by the farmers attending at the coconut-based demonstration plantations and the abaca growing demonstration farms might be designated as the Small Coconut Farmers Organizations of the Philippines (SCFOP) and the Abaca Growers Association (AGA), respectively. All these CGs including SCFOPs and AGAs would be affiliated to the Project area-level MPC to obtain cooperative services in banking, marketing and education/training.

The farmers who would be given change to multiply the domestic animals, birds and fresh water fish are also encouraged to organize themselves into appropriate groups, and obtain cooperative services in banking, marketing and education/training from the Project-level MPC.

The combination of the three essential factors of agricultural production, viz; (i) timely supply of input materials in appropriate kind and dosage; (ii) common-use of the Project-provided tools, implements and machinery for land-preparation, post-harvest activities (including processing, warehousing, transport and marketing); and (iii) intensive crop-wise technical guidance would bring forward a conspicuously enlarged reproduction of each crop compared with the results so far obtainable from the traditional cultivation methods. This would ensure the success of the demonstration farm program, and the increasing numbers of the Project area farmers would volunteer to join the crop-wise Cultivators' Groups so much so that each Group would expand in its membership as well as in its capability as the fullfledged cooperative. Under such circumstances, the MPC at the Project area-level might as well re-organize itself as the Municipal Federation centering for its affiliated member-cooperatives in banking, marketing and education/training.

5.2. Functional Aspects of Farmers' Organizations

5.2.1. Operation and Management of Facilities Under the Project

1) Irrigation facilities

The beneficiary farmers would organize themselves into the Irrigators Association (IA) for O & M of the facilities. IA would be constantly supported by the SIRDP field office with NIA's assistance in case such irrigation facilities should be damaged by natural calamities such as floods and typhoons. It should be most desirable that the members of the Irrigators' Association whose farms might be included within the sites selected by the Project as the Rice-Based Demonstration Farm - Irrigated would organize themselves into the Rice Cultivators' Group (RCG) to be entitled for

provision of various means of production such as agricultural tools, implements and machinery, together with input materials like improved seeds, fertilizers, farm-chemicals, etc., from the Project. RCG would be linked up with the MPC which will be organized in the Project area so that cooperative services in banking, marketing and education/training will also be obtained for its own development.

2) Water supply facilities

The beneficiaries of the proposed water supply system would organize themselves into an appropriate Water Users' Group (WUG) for proper O & M of such water distribution conveniences, through joint contribution of equitable water fee. WUG would be constantly supported by the SIRDP field office in cooperation with the line agencies concerned in case of water supply system's breakdown or any other difficulties in a smooth water distribution.

3) Rural electrification

The beneficiaries of the rural electrification would likewise organize themselves into an appropriate association to ensure a smooth operation and maintenance of the electric supply system. The responsibility of O & M might be generally borne by the said association under the guidance and supervision of the SIRDP field office in cooperation with SAMELCO II.

4) Rural road network

The SIRDP field office would be responsible for a constant surveillance of the road network provided by the project and, also, for an immediate reporting to responsible line agencies in case of any sign or signs of its deterioration and for the maintenance of the road network.

5.2.2. Operation and Management of Demonstration Farm-Based Cultivators' Group

1) Rice-based demonstration farm (irrigated)

The farmers who have been engaged in agricultural activities in the rice-based demonstration farm are encouraged to organize themselves into each one CG. The Irrigated RCG organized by the farmers attending at the operation and management of the demonstration farms will enjoy provision of the tools, implements, machinery and other facilities including hand-tractors, dry pavement, mechanical dryers, weighing scales, etc. as well as an intensive technical guidance on irrigated rice cultivation method from the extension workers. These Irrigated RCGs will be affiliated to the MPC at the Project area-level with the assistance, if necessary, of the SIRDP field office and the DA officers.

2) Rice-based demonstration farm (rainfed)

The farmers who have been engaged in rainfed rice cultivation in the rice based demonstration farm (rainfed) will organize themselves into the Rainfed RCGs to obtain input supply including seeds, fertilizers and farm-chemicals, as well as hand-tractors and post-harvest facilities. They can expect to receive an intensive technical guidance on rainfed rice cultivation method from the extension workers. They will affiliate themselves to the Project area-level MPC for cooperative services in attaining an enlarged reproduction of rainfed rice.

3) Corn-based demonstration farm

The farmers cultivating corn would be organized into the Corn CG in operating the proposed corn-based demonstration farm which is aimed at establishing the intensive and diversified corn rotation cropping patterns suitable for corn-belt in the Area. Intensive

technical guidance by the extension workers would be given in accompaniment with an adequate supply of input materials including the improved seeds, not only of corn but also of peanut, mungbean, vegetable and other potential rotation crops, and appropriate means of production, like tractor and corn power sheller, for joint-use among the group-members. Post-harvest repayment for such input materials by the group-members and amortization of the Project-provided means of production by each group would have to be adhered to as in the case of the cron CGs which attend at operation and management of the corn demonstration farms.

4) Coconut-based demonstration farm

The coconut farmers working in the Coconut demonstration farms should organize themselves into the Coconut Cultivators' Groups (CCGs) in the capacity of the local Chapter of the Small Coconut Farmers Organization of the Philippines (SCFOP) which would be looked after by the PCA through its local development officer. Among the coconut development programs being pushed by the PCA are: (i) distribution of seedlings among the coconut farmers for replating of non-productive coconut areas; (ii) crop diversification to promote intercrops on small coconut farms; (iii) coconut timber utilization and disposal to assist farmers with production of coco-timber; and (v) coconut intercropping program which is now covered by the Community Economic Development Program (CEDP) in conjunction with the United Coconut Planters Bank (UCPB) encompassing all income generating projects of coconut farmers. The Project, in collaboration with PCA program, is going to provide the organized coconut farmers with both the input materials and coconut and coco-timber processing equipment and machinery such as the copra dryer, coconut shell charcoal kiln, chain/disc sows for coco-lumbering. These two coconut farmers' groups are encouraged to link up, together with another existing coconut farmers' group to take full advantage of cooperative services in banking marketing and education/training for their own development.

5) Abaca growing demonstration farm

The abaca growing farmers are encouraged to organize themselves into the Abaca Growers Association (AGA), under the guidance of the SIRDP field office, with assistance from the FIDA. The local development officer being stationed by the FIDA is working hard to promote the growth and development of fiber industry through (i) promoting the adoption of high yielding varieties of abaca and improved methods of production; (ii) ensuring the maintenance of adequate grading standards among abaca traders; (iii) assisting in the establishment of cottage industries using abaca raw materials. In its efforts in realizing these targets, FIDA is trying to make institutional approach such as (1) expansion and diversification through nucleus estate, contract growing, profit sharing and stock dispersal schemes; (2) improvement of rural infrastructure such as farm-to-market roads, communications and other social infrastructure; and (3) selective upgrading and expansion of support services and provision of planting materials.

5.3. Agriculture Related Programs

5.3.1. Freshwater Fish Culture Program

The freshwater fish hatchery station would be provided so that it could supply enough tilapia fry in the Project area. Two Barangays would be selected among others for rearing of tilapia fry on a commercial level under an intensive technical guidance of the SIRDP field office. Fish rearing in this case would take place either in the farmers' backyard ponds or in their paddy fields for rice-fish culture. As this practice will expand among the increasing number of the farmers, they will organize among themselves the Inland Fishermen's Group which may profitably join the Project area MPC for various kinds of cooperative services particularly in banking marketing and education/training.

5.3.2. Livestock Raising and Dispersal Program

Livestock dispersal program has been undertaken by the DA since sometime back but the progressive elements of the rural population have shown more concern towards crop diversification rather than livestock production mainly because the cash return from livestock activities are subject to long delay since farmers must return the first offspring to the DA. Nevertheless, carabao, among other animals, are the primary source of power having an important role in farming system. Such small livestock like goats, ducks and chickens can also be integrated into the farming systems with considerable benefits towards the farm-households in terms of not only economic but nutritional also.

Stock animals and birds will be distributed among 30 households for multiplication and dispersal among five Barangays. In addition to this, ten farmers in two Barangays will be supplied with each 20 heads of hens. Both the original raisers and the recipients of their offsprings are encouraged to organize themselves into appropriate groups so that they could better solve their mutual problems and difficulties, on the one hand, and help each other more readily, on the other. Their affiliation to the Project-area MPC would be the logical consequence in view of their own growth and development.

5.4. Strategies for Institutional Development

5.4.1. Basic Strategy

The ADPP area which embraces a part of Gandara and the bulk of San Jorge is not without the so-called Farmers' Organizations including both the Cooperatives such as the Area Marketing Cooperatives and Samahang Nayons as well as the non-cooperatives like the Farmers Associations, Rural Improvement Clubs and 4-H Clubs.

The farmer organizing program is organically combined and closely dove-tailed with the other major components of ADPP, such as the infrastructure development aimed at provision of rural water supply, rural electrification and rural road networks, and the agricultural development packaging the establishment of demonstration farms with the improvement of nursery stations, seed/seedling banks, inland fishery development and the encouragements for livestock raising/dispersal activities. This is because the formation of community organizations is essential for the productive use of the infrastructure and institutional support provided under the Project.

5.4.2. Implementation Methodology

Now, the above involves, among other things: (i) organization of the demonstration farm-wise CGs; (ii) education/training on behalf of each CG and its constituent member farmers; (iii) strengthening of the function of the SIRDP field office; (iv) establishment of the MPC at the Project area level; (v) education/training of the office-bearers and employees of the MPC on cooperative operation/management, particularly on banking, marketing and education/training aspects, and (vi) turning the CGs into fullfledged Barangay-based MPCs and promotion of the proposed MPC to a Municipal Cooperative Federation.

The essential steps toward achieving these self-imposed tasks would be taken, phase by phase, roughly as briefed below:

1) Preparatory phase

The preparatory phase will involve, first of all, the lining-up of the SIRDP field office so that its mechanism would come to be equipped with the minimum necessary capability to respond almost all the challenges which the project implementation might provoke from time to time. As soon as this will have been done, two trainings:

(i) Program Orientation Workshop, and (ii) Basic Farmer Organizing Seminar should be arranged through the sponsorship of the SIRDP office on behalf of the officials of the provincial/municipal line agencies of either Provincial or National Government such as DA, NIA, NFA, DPWH, PEO, DLG, DAR, etc., as well as the development/technical officers of PCA, FIDA and other agencies concerned.

a) Program orientation workshop

This is to introduce and explain the entire area of ADPP: its aims and purposes; component schemes and programs; their network and mechanisms for coordination and follow-up. Particular emphasis will have to be made on the formation of the Project Technical Support Task Force comprising of the key personnel among the participants and its important function in letting the Demonstration Farm-based CGs/SCFOPs, AGAs achieve the enlarged reproduction of each crop so that the neighboring farmers would volunteer to join these group structures by geometrical progression until the entire Project-area farmers could be brought under the umbrella of various CGs.

b) Basic farmer organizing seminar

This is to intimate the participants of the basic philosophy and methodology of farmer organizing under the Project.

2) Institution Building Phase

During this Phase, institution building of the crop-wise CGs and the Agriculture Related Associations of those who will be engaged in livestock and freshwater fish programs will have to be completed. This involves mobilization of the NGOs staff for provision of assistance in wide areas covering the farmer organization process, the building of organized group structures, the education/training of the farmers' group members, and the education/training of the line agency officers and SIRDP staff.

Accordingly, the education on the institution building will have to be continued on behalf of the SIRDP staff and line agency officers, while providing the management training with the key

personnel of the crop-wise CGs including SCFOPs and AGAs as well as the livestock and fishery associations.

3) Cooperative Building Phase

Sooner than the completion of the crop-wise CG building, the establishment of the Project-area level MPC would have to be taken up which should be heralded by the holding of the Cooperative Training Seminar on behalf of the would-be office bearers and employees of the newly emerging MPC on the cooperative principles and various skills of cooperative management particularly in banking, marketing and education/training.

Indeed, this will stand for the pre-membership seminar to be conducted by DA cooperative officer or deputized by NGOs which is required as one of the prerequisites for official initiation of MPC.

Following to the cooperative training seminar, a continuing education should be carried on, in a series of seminars, towards the SIRDP staff on the skills needed for program management and operation.

Upon completion of the CG formation and the MPC organization, it is essential to hold the Network Building & Consultation Seminars on behalf of the CG leaders, the office bearers and employees of the MPC, the line agency officers and the SIRDP staff; these seminars are meant for brushing up the participants' knowledge and concepts of the mechanism for coordination and follow-up of the project programs. It is very much hoped for that these seminars would have been concluded well in advance of the completion of the project's infrastructure construction programs involving such as the road network; rural electrification; water supply system; irrigation and drainage facilities; demonstration farms' consolidation; replenishment of seed/seedlings farms/banks; improvement works of freshwater fish hatchery and nursery, and others.

5.4.3. Training Support Program

Whilst the essential steps toward achieving the task of farmer organizing are being taken phase by phase as having been discussed in the preceding subsection, there arises the need for training to be provided at each of the various stages. Most of training support will be provided through the services of a number of different NGOs. Their specific role will be to provide the training support to the SIRDP staff, leaders of various CGs, office bearers and employees of the MPC and the line agency staff.

5.4.4. NGO Participation

The role of the NGOs in this program will comprise of the provision of training assistance in wide areas covering the farmer organization process, the building of organized group structure, and the organization and management of MPC including such technicalities as an adoption of sound accounting system and accurate bookkeeping system as well as auditing of the financial dealings of the CG and the MPC.

For the basic training in the farmer organization process, the assistance might be sought from the College of Social Work and Community Development (CSWCP) of the University of the Philippines. Training support in organization, management and operation of the Cooperative including that for upgrading the production-oriented group structures to the Barangay-based MPCs and promoting the proposed MPC to the municipal cooperative federation might be sought from the Agricultural Credit and Cooperative Institute, Los Baños.

Identification of NGOs for implementation of the institution and cooperative building phases would require more careful study. Yet, the involvement of the Visayas Cooperative Development Center (VICTO) for the provision of support to the CG and MPC programs, involving the membership development and expansion, organizational

competence building, integration and expansion will worth a serious consideration. The technical aspects for which VICTO's assistance is specifically sought are the trainings on accurate bookkeeping towards the demonstration farm-based CGs, SCFOPs, AGAs, and on sound accounting system to be maintained by the MPC, so that it would be taught how to prepare reliable financial statements including balance sheet and profit & loss statement at the end of each fiscal year or as required for deliberation in the general meetings of these organizations. Other NCOs like the Philippine Business for Social Progress (PBSP), the Center for Small Scale Industry (CSSI), and the Community Organizing Team (COT) might as well be considered for active participation in the processes of the Project implementation, particularly of its farmer organizing programs.

5.4.5. Schedule for Implementation of Farmer Organizing Program

Since it is absolutely necessary that the farmer organizing program discussed in the preceding sub-section should be concluded in its entirety prior to the completion of the construction/consolidation works of the proposed socio-economic infrastructures and the agricultural demonstration farms, the implementation schedule of the program would have to be carefully planned and carried out without undue delay by taking into consideration a proper timing of the routine proceedings for the implementation of this Project.

The farmers organizing staff should be ready on the field in assisting the member-farmers of the CGs on the occasion of their receiving farm tools, equipment and machinery for land preparation of the consolidated demonstration farms and, subsequently, the planting materials for actual farming there not later than two years after the commencement of the Project implementation.

5.4.6. Proposed Organizational Set-up for Management of ADPP

In the implementation of the proposed ADPP, ADPP relates to various governmental line agencies/institutions and non-governmental organizations as its source of support and guidance and working partners of the Project. The proposed organizational set-up for implementation of ADPP is indicated in Table 5.4.1. The demonstration and trial activities of ADPP will coordinate with DA, PCA, FIDA, BFD, PCARRD, NIA, NFA, VISCA, SPC, SNAS, FSDP, etc. Training programs for farmers' leaders and technicians will be provided by RTC, FSDP, VISCA, UPLB, DA, PCA, FIDA, and NGOs, community development/organizing support will be extended by DA, PCA, FIDA, SIRDPO, NGOs and other agencies concerned (refer to Table 5.4.1).

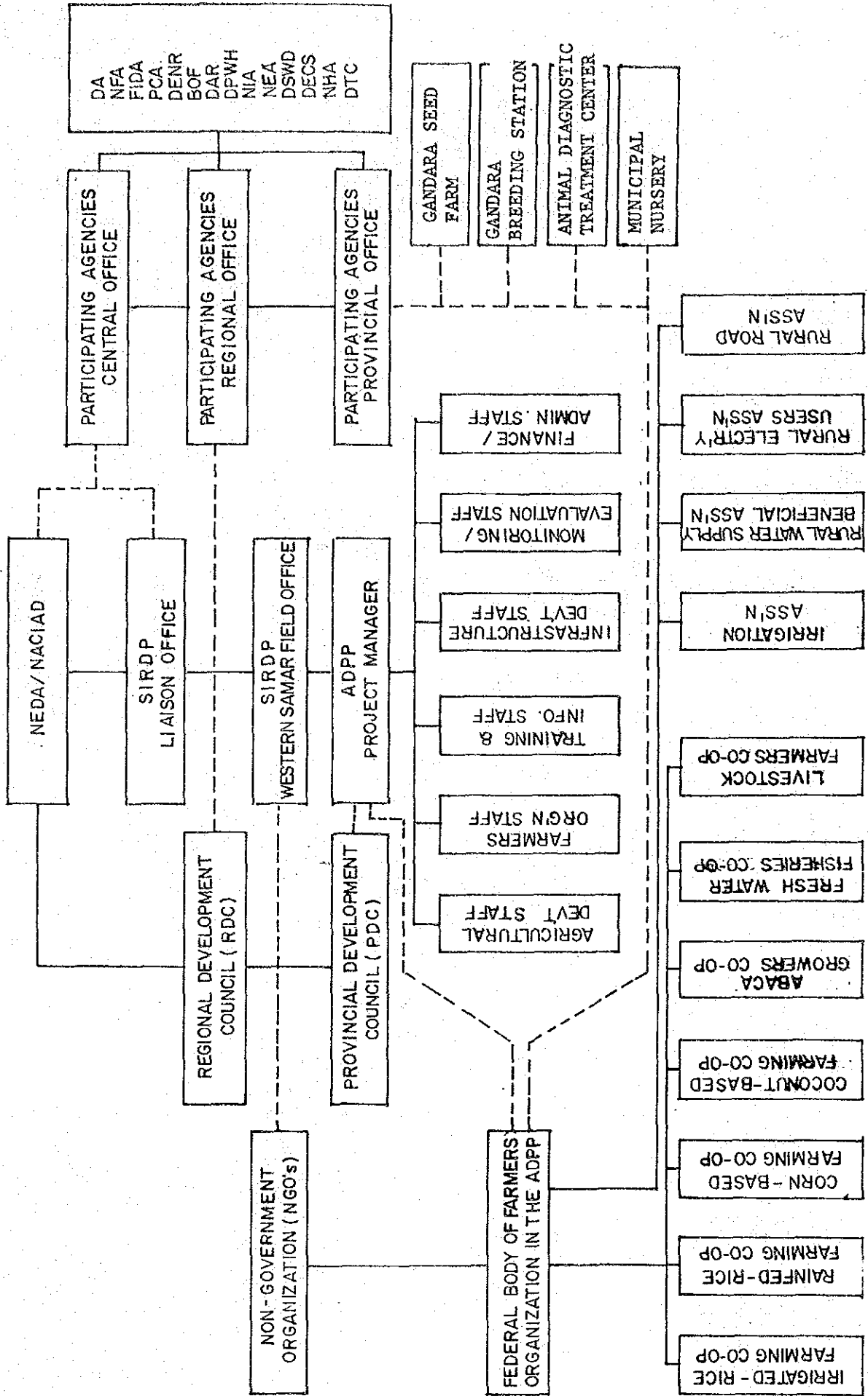
The Project Manager represented by the SIRDP office would have the authority and responsibility for the overall integration, coordination and monitoring of planning, implementation and administration of the Project in connection with the Integrated Agricultural/Rural Development Project in the Samar province (refer to Figure 5.4.1).

For the smooth and effective implementation of the Project a joint committee would be established. The committee would meet regularly upon request of the chairman and the co-chairman. The representative of the local government (Provincial Development Coordinator) and the head of line agencies concerned including NEDA will be the key member of the committee.

Table 5.4.1.1. Proposed Agencies for Implementation of ADPP by Activity

Activities	Key Agency	Supporting and/or Related Agencies
1. On-Farm Demonstration of Farming System		
(1) Rice-based farming	ADPP/CO-OP	DA, NIA (Irrigated Rice)
(2) Corn-based farming	ADPP/CO-OP	DA
(3) Coconut-based farming	ADPP/CO-OP	PCA, DA, VISCA
(4) Abaca cultivation	ADPP/CO-OP	FIDA, DA, VISCA
(5) Hillside farming/Agroforestry	ADPP/CO-OP	DA, BFD, PCARRD, FSDP
(6) Freshwater fish culture	ADPP/CO-OP	DA
2. Dispersal of Livestock/Poultry	ADPP/CO-OP	DA
3. Management of Agricultural Development Facilities		
(1) Motor Pool and Workshop for Tractor (ADPC)	ADPC	
(2) Soil Test Laboratory with soil Inoculants and Mushroom Spawn Units (ADPC)	ADPP	DA
(3) Seed Analysis Laboratory (ADPC)	ADPP	DA
(4) Crop Protection Facilities (ADPC and ADPP Area)	ADPP	DA, Non Governmental Agencies
(5) Training and Extension Facilities	ADPP	DA, RTC, PCARRD, UPLB, VISCA, SPC, SNAS
(6) Gandara Seed Farm (GSF)	GSF (DA)	
(7) GANDARA Breeding Station (GBS)	GBS (DA)	
(8) Animal Diagnostic and Treatment center	ADPP	DA (Samar Province)
(9) Municipal Nursery	ADPP	DA (Samar Province)
(10) Freshwater Fish Hatchery	ADPP	DA (Related Municipalities)
(11) Abaca Seed Bank	ADPP	FIDA, DA
4. Improvement of Post Harvest	ADPP	DA, NFA, PCA, FIDA

Figure 5.4.1. Proposed Management Organization Chart of ADPP



CHAPTER 6. AGRICULTURAL DEVELOPMENT AND PROMOTION
CENTER (ADPC)

CHAPTER 6. AGRICULTURAL DEVELOPMENT AND PROMOTION CENTER (ADPC)

6.1. Objectives of ADPC

Agricultural Development and Promotion Center (ADPC) is a central building serving as a center of ADPP for management, operation and training of staff and farmers.

ADPP has various development components which are scattered in the ADPP area of about 9,000 ha in total. Each development component will be achieved independently, however, the performance of ADPP as an integrated development of the rural area shall be properly managed and superintended by ADPC for success. The integrated performance of the development components under ADPP can be easily attained up to the program, however, respective component alone will reach to only the unexpected extent.

6.2. Component of ADPC

Major components of ADPC are as follows:

- ADPC Administrative Building
- Management and coordination of various demonstration farms
- Management on trial farm of agroforestry farming
- Management on improvement of farm products marketing facilities
- Management on improvement of the existing livestock dispersal facilities
- Soil analysis and seed analysis
- Crop protection observation system development with emphasis on surveillance and early warning system
- Strengthening of agricultural extension services

Aside from the above-mentioned roles, one of significant roles of ADPC is training and extension services. Investment in human resources development is fundamental to the long-term success of the

Project. Such investment centers on provision of learning opportunities with under-privileged group and individuals so as to enable them to understand and to control their changing physical, economic and social environment, if possible.

To support the development program of ADPP, the following training are recommended:

- 1) Farmer's organization
 - a) Operation and maintenance (O/M) on social infrastructure
 - Rural Water Supply
 - Rural Electrification
 - Rural Road
 - b) O/M on irrigation and drainage facilities
 - Irrigation facilities
 - Drainage facilities
 - c) O/M on farming
 - d) Barangay communication development
- 2) Farming technology
 - a) Farming of rice-based, corn-based and coconut based
 - b) Abaca planting and other diversified croppings
 - c) Trial on hillside farming/agroforestry
 - d) Livestock raising
 - e) Inland fisheries
 - f) Soil control and fertilizer & chemical application
 - g) Agricultural machinery
 - h) Draft animals
- 3) Post harvest and agri-industries
 - a) Crop productions
 - b) Livestock productions
- 4) Handicraft
 - a) Ticog
 - b) Rattan
- 5) Marketing
 - a) Marketing research
 - b) Lecture on marketing to SNAS students

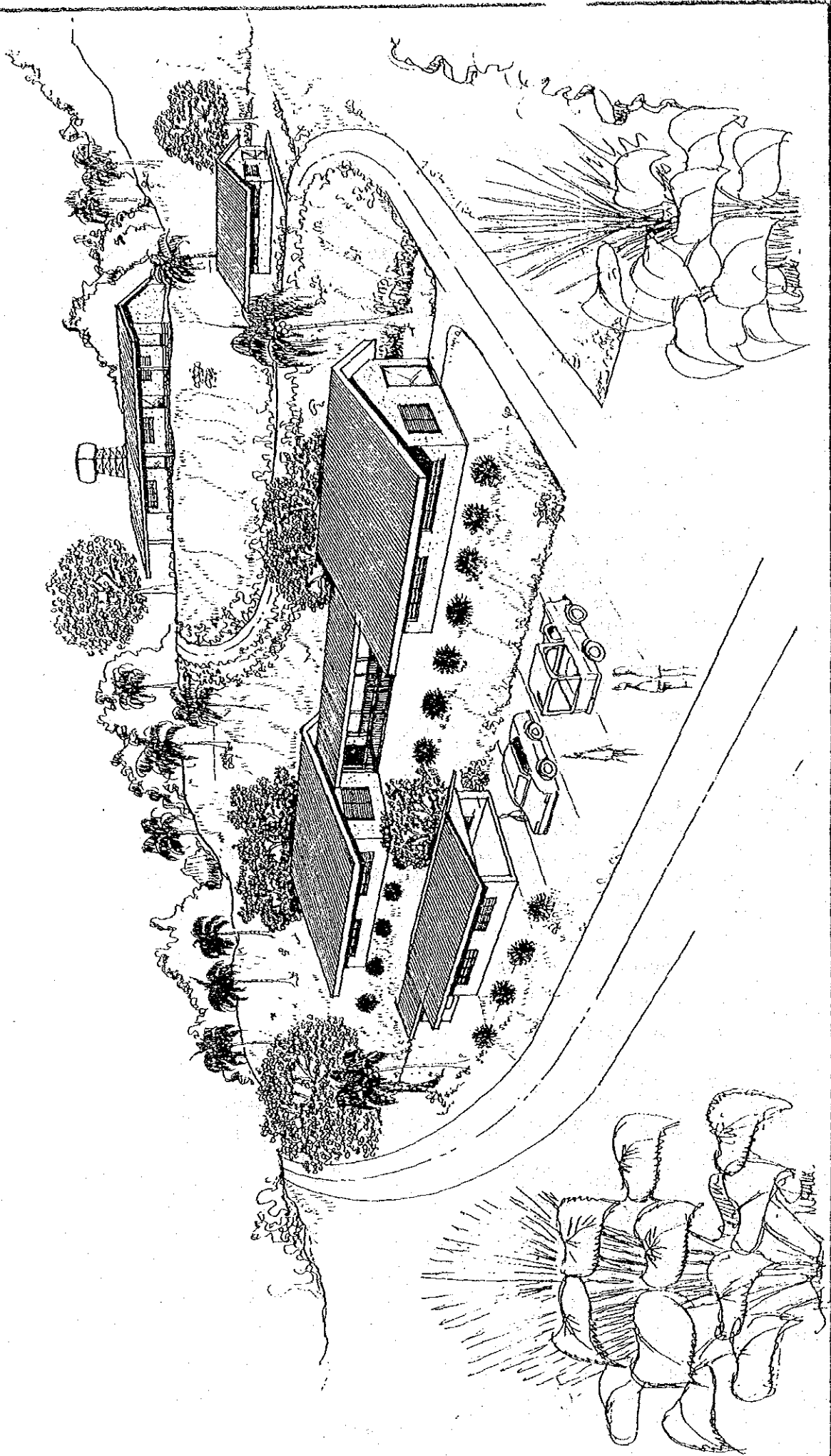
6.3. Facilities of ADPC

ADPP shall be operated by the ADPC staff under management of SIRDP in cooperation with various line agencies. ADPC as a core of ADPP shall be equipped with the following facilities and located along the Maharlika Highway nearby the Gandara Seed Farm (refer to Figures 6.3.1 and 6.3.2).

Major buildings are proposed as follows:

1)	Administrative office	610 m ²
	- Project Manager Office	
	- Project Development Div.	
	- Project Management Div.	
	- Accounting/Administrative Div.	
	- Other Personnel	
	- Conference Room	
	- Storage Room	
	- Line Agency and Other Officers Room	
	- Association of Farmers' Organization	
	- Public Relation & Exhibit Room	
	- Other Utilities	
2)	Compound laboratory	160 m ²
	- Soil Test Laboratory	
	- Seed Analysis Laboratory	
	- Crop Protection Stock Room	
	- Other Utilities	
3)	Lecture building	150 m ²
4)	Rural Health Unit	30 m ²
5)	Warehouse	100 m ²
6)	Garage & Workshop	200 m ²
7)	Dormitory	300 m ²
8)	Guest House for Outside Teachers	100 m ²
9)	Canteen with Kitchen	50 m ²
	<u>Total</u>	<u>1,700 m²</u>

FIGURE 6.3.1. BIRD EYE'S VIEW OF ADPC



Major Buildings of ADPC		
No.	Name of Bldg.	Scale
1.	Administration	610m ²
2.	Compound Laboratory	150
3.	Lecture Bldg.	150
4.	Rural Health Unit	30
5.	Warehouse	100
6.	Garage & Workshop	200
7.	Dormitory	300
8.	Guest House for outside teachers	100
9.	Canteen & kitchen	50
	<u>Total</u>	<u>1,700</u>

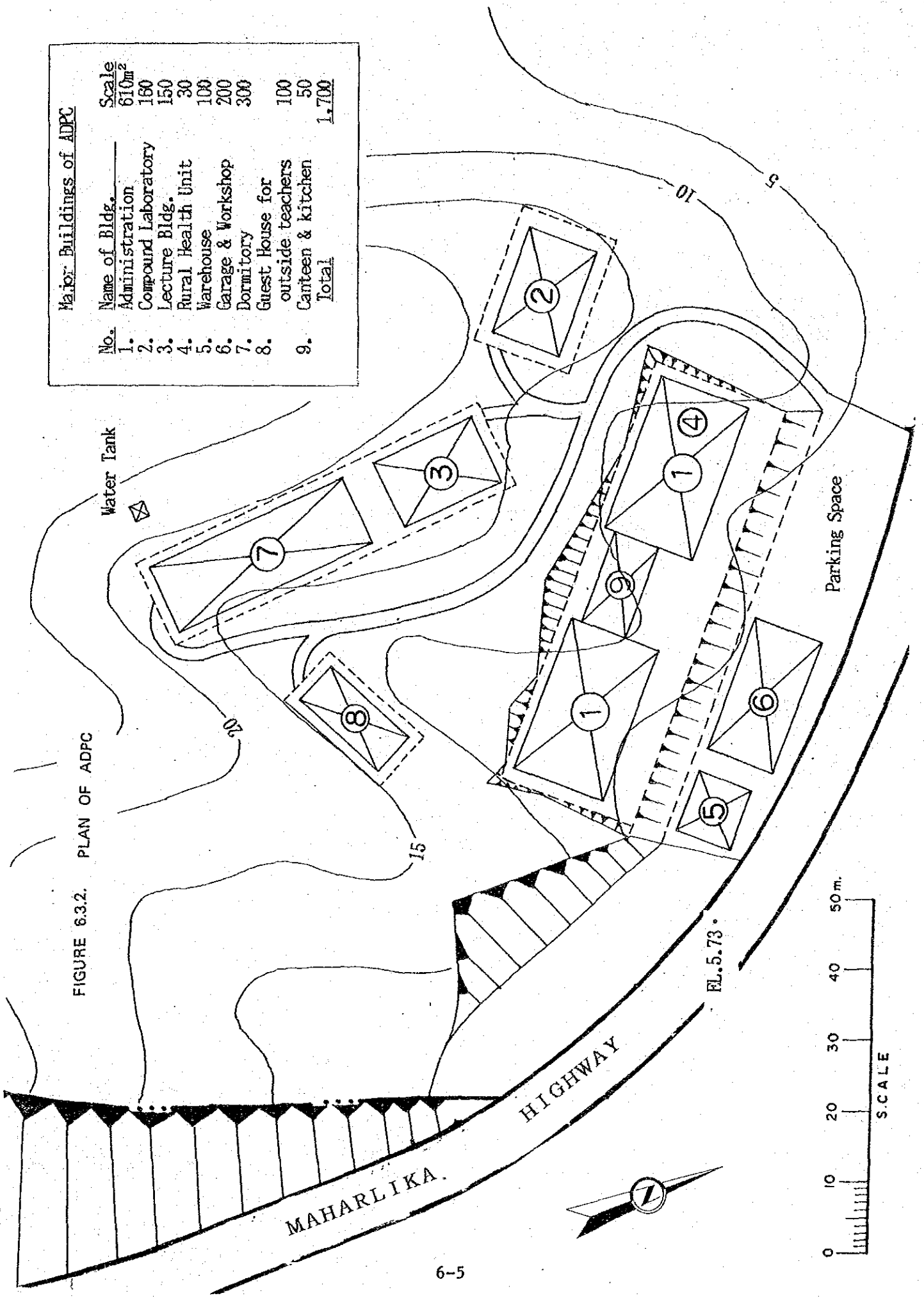


FIGURE 6.3.2. PLAN OF ADPC

CHAPTER 7. DEVELOPMENT COST

CHAPTER 7. DEVELOPMENT COST

7.1. Estimation Condition

The quantities of works were carefully calculated and reviewed basing on the preliminary design in each development plan of ADPP.

The construction mode is contract basis and the basic unit cost was determined basing on the unit price that has been used in the construction project in Region VIII including the Samar province. The price year in this development cost estimation is applied as of June 1987 as the same as the development cost in the Master Plan. For materials and equipment to be procured from outside of the philippines, the CIF price at Manila is used in this estimation.

The exchange rate between Philippine pesos and U.S. dollar is adapted at 20.50 pesos (US\$1.00=20.50 Philippine pesos).

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

7.2. Development Cost

The total development cost of the ADPP at the current price is estimated at 562,850 million pesos. The summary of the project cost is as shown in Table 7.2.1 and its break down is in Table 7.2.2.

7.3. Operation and Maintenance Cost

The operation and maintenance cost for the five year short term period is amounted at 155 million pesos including the cost of land acquisition and compensation, as shown in Tables 7.3.1 and 7.3.2.

Table 7.2.1. Summary of Development Cost of ADPP
at Current Price

(P'000)			
<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Amount</u>
A. Agricultural Development	lot	1	<u>54,800</u>
B. Agricultural Infrastructure Development			
1) Irrigation Development	ha	455	85,000
2) Drainage Development	"	310	120,000
3) Rural Road Development	km	44.4	125,100
4) Rural Water Supply Development	"	33.6	84,600
5) Rural Electrification Development	"	40.8	7,800
6) Rural Health Development	Place	4	4,000
7) Farmer's House Development	"	2	1,850
Sub-Total of B			<u>428,350</u>
C. Post-Harvest/Marketing Services Assistance	lot	1	<u>10,600</u>
D. Farmer's Organization Development	lot	1	<u>1,600</u>
E. ADPC	lot	1	<u>67,500</u>
Total (A - E)			<u>562,850</u>

Table 7.2.2. Breakdown of Project Cost (1/4)

Description	Unit	Q'ty	Rate	(P'000)		Remark
				Amount		
1. Agricultural Development						
1) Rice-Based Farming						
Irrigated	Place	2	2,990	5,980		
Rainfed	"	2	1,870	3,740		
Sub-total of 1)				<u>9,720</u>		
2) Corn-Based Farming	Place	2	1,920	3,840		
3) Coconut-Based Farming	Place	2	1,640	3,280		
4) Abaca Development						
Abaca Development	Place	2	1,280	2,560		
Abaca Seed Bank	"	1	3,650	3,650		
Sub-total of 4)				<u>6,210</u>		
5) Hillside Farming/Agroforestry Development	Place	2	207	414		
6) Livestock Development						
Animal Diagonos & Treatment Center	Place	1	7,166	7,166		
Gaudara Breeding Station	"	1	5,758	5,758		
Carabao Dispersal	"	2	233	466		
Goat Dispersal	"	2	146	292		
Duck Dispersal	"	2	47	94		
Cockrel Dispersal	"	2	40	80		
Sub-total of 6)				<u>13,856</u>		
7) Nursery Station Development						
Gaudara Seed Farm	Place	1	3,858	3,858		
Municipal Nursery	"	2	2,450	4,900		
Crop Protection Facility	"	3	344	1,032		
Sub-total of 7)				<u>9,790</u>		
8) Fresh Water Fish Culture Development						
Hatchery & Nursery Pond	Place	1	6,020	6,020		
Demonstration of Fresh Water Fish Culture	"	2	835	1,670		
Sub-total of 8)				<u>7,690</u>		
T o t a l				<u>54,800</u>		
2. Irrigation Development						
1) La Paz CIS						
Irrigation Canal (lat)	ha	145	27	3,915		
On-Farm Facility	"	145	50	7,250		
Drainage Canal	"	60	28	1,680		
Sub-total of 1)				<u>12,845</u>		
2) Quezon CIS						
Intake Facility	Place	2	1,140	2,280		
Irrigation Canal (lat)	ha	30	27	810		
On-Farm Facility	"	30	50	1,500		
Drainage Canal	"	30	28	840		
Sub-total of 2)				<u>5,430</u>		
3) Aurora CIS						
Intake Facility	Place	1	1,140	1,140		
Irrigation Canal (lat)	ha	10	27	270		
On-Farm Facility	"	10	50	500		
Drainage Canal	"	10	28	280		
Sub-total of 3)				<u>2,190</u>		
4) Bulao PIP						
Pump Station	Place	1	8,860	8,860		
Irrigation Canal (Main)	ha	130	2.5	325		
do (lat)	"	130	27	3,510		
On-Farm Facility	"	130	50	6,500		
Drainage Canal	"	35	28	980		
Sub-total of 4)				<u>20,175</u>		

(Cont'd)

Table 7.2.2. Breakdown of Project Cost (2/4)

				(P'000)		
Description	Unit	Q'ty	Rate	Amount	Remark	
5) Bulao South PIP						
Portable Pump	set	8	400	3,200		
On-Farm Facility	ha	120	50	6,000		
Drainage Canal	"	120	28	3,360		
Sub-total of 5)				<u>12,560</u>		
6) Pologon CIS						
Intake Facility	Place	1	1,140	1,140		
Irrigation Canal (Lat)	ha	20	27	540		
On-Farm Facility	"	20	50	1,000		
Drainage Canal	"	13	28	364		
Sub-total of 6)				<u>3,044</u>		
7) Water Level & Rain Guage Sta.						
Water Level Guage Sta.	Place	5	514	2,570		
Rain Guage Sta.	"	5	166	830		
Sub-total of 7)				<u>3,400</u>		
8) Construction Machine	lot	1	25,350	25,350		
T o t a l				<u>85,000</u>		
3. Drainage Development						
1) La Paz Area	ha	85	295	25,075		
2) Bulao Area	"	95	295	28,025		
3) Pologon Area	"	15	295	4,425		
4) Buena Vista Area	"	30	295	8,850		
5) Ranera Area	"	5	295	1,475		
6) Anquiñana Area	"	20	295	5,900		
7) Sapiñit Area	"	20	295	5,900		
8) Rosalim Area	"	15	295	4,425		
9) Diaz Area	"	5	295	1,475		
10) San Agustin Area	"	20	295	5,900		
11) Construction Machine	lot	1	28,550	28,550		
T o t a l				<u>120,000</u>		
4. Rural Road Development						
1) Farm to Market Road (New)						
La Paz - Manbon	km	1.7		3,001		
Bulao - La Paz	"	0.1		12,193		
Buena Vista - Cantaguic	"	5.7		15,692		
Quezon - Janipon	"	11.5		32,631		
Aurora - Canyaki	"	4.0		8,425		
Erenas - San Juan	"	0.7		4,943		
Blanca Aurora - Tomoghog	"	2.8		5,515		
Sub-total of 1)	km	<u>26.5</u>		<u>82,400</u>		
2) Farm to Market Road (Improvement)						
San Agustin - Pologon	km	4.7		5,023		
Buena Vista South	"	1.2		1,427		
La Paz - Pulagan	"	2.0		2,365		
Blanca Aurora - Buena Vista	"	4.0		4,085		
Sub-total of 2)	km	<u>11.9</u>		<u>12,900</u>		
3) Farm Road (New)						
Bulao Area	km	<u>6.0</u>		<u>10,700</u>		
4) Construction Machine	lot	<u>1.0</u>		<u>19,100</u>		
T o t a l				<u>125,100</u>		
5. Rural Water Supply Development						
1) Pipe Line						
DCIP (ø 300)	m	880	5.12	4,505.6		
-do- (ø 250)	"	2,600	3.77	9,802.0		
-do- (ø 200)	"	10,680	3.13	33,428.4		
GIP (ø 150)	"	7,240	1.74	12,597.6		
-do- (ø 100)	"	770	1.04	800.8		
-do- (ø 80)	"	4,570	0.79	3,610.3		
-do- (ø 50)	"	6,860	0.54	3,704.4		
Sub-total of 1)				<u>68,449.1</u>		

(Cont'd)

Table 7.2.2. Breakdown of Project Cost (3/4)

				(P'000)	
Description	Unit	Qty	Rate	Amount	Remark
2) Flow Meter/Stop Valve/ Air Valve	lot	1		<u>2,982.1</u>	
3) Other Facilities					
Valve Box (ø300 - ø200)	place	27	5.3	143.1	
- do (ø150 - ø 50)	"	263	3.5	920.5	
Faucet	"	324	19.3	6,253.2	
San Jorge Reservoir	"	1	1,620	1,620.0	
Gandara Reservoir	"	1	1,540	1,540.0	
Intake Facility	"	2	300	600.0	
Chlorination Facility	"	2	1,046	2,092.0	
Sub-total of 3)				<u>13,168.8</u>	
<u>T o t a l</u>				<u>84,600</u>	
6. Rural Electrification Development					
1) Distribution Line					
Three Phase Line	km	12.1	340	4,114	
Single Phase Line	"	18.2	133.3	2,426	
Sub-total of 1)	"	<u>30.3</u>		<u>6,540</u>	
2) Secondary Line					
Open Secondary	km	<u>10.5</u>	120	<u>1,260</u>	
<u>T o t a l</u>				<u>7,800</u>	
7. Rural Health Development					
Solar Power Cold Chain System	place	4	1,000	4,000	
<u>T o t a l</u>				<u>4,000</u>	
8. Farmer's House Development					
Model Farm House	place	2	925	1,850	
<u>T o t a l</u>				<u>1,850</u>	
9. Post-Harvest/Marketing Services Assistance					
Rice Mill	set	1	1,070	1,070	
Truck	"	7	712	4,984	
Spair Parts	lot	1		988	
Office/Warehouse	m ²	120	5.4	648	
Dry Pavement	"	2,000	0.73	1,460	
Shelter	"	100	2.9	290	
Meat Refrigerator	set	3	178	534	
Miscellaneous	lot	1		626	
<u>T o t a l</u>				<u>10,600</u>	
10. Farmer's Organization Development					
Pick-up	set	2	356	712	
Motorcycle	"	10	71.2	712	
Spair Parts	lot	1		176	
<u>T o t a l</u>				<u>1,600</u>	
11. ABPC					
1) Building/Facility					
Office Building/Dormitory/etc.	m ²	1,400	10.8	15,120	
Warehouse/Garage/Workshop	"	300	5.4	1,620	
Parking Area Pavement	"	300	0.73	219	
Furniture	lot	1		4,265.6	
Land Grading	"	1		5,087.7	
Sanitary/Electric/Others	"	1		5,087.7	
Sub-total of 1)				<u>31,400</u>	

(Cont'd)

Table 7.2.2. Break Down of Project Cost (4/4)

					(P'000)	
Description	Unit	Q'ty	Rate	Amount	Remark	
2) Office & Laboratory Equipment						
Office Equipment	lot	1		2,100		
Soil Laboratory	"	1		3,600		
Seed Laboratory	"	1		2,100		
Crop Protection	"	1		344		
Training Equipment	"	1		4,500		
Workshop	"	1		3,600		
Meteorological Station	"	1		1,800		
Canteen/Kitchen	"	1		900		
Generator	"	2		712		
Water Tank	"	1		1,400		
Spair Parts	"	1		3,144		
Sub-total of 2)				<u>24,200</u>		
3) Vehicle						
Tractor	set	3	980	2,940		
Jeep	"	2	623	1,246		
Truck	"	2	712	1,424		
Microbus	"	1	1,200	1,200		
Pick-up	"	4	356	1,424		
Motorcycle	"	20	71.2	1,424		
Motorboat	"	1	700	700		
Spair Parts	lot	1		1,524		
Sub-total of 3)				<u>11,900</u>		
<u>T o t a l</u>				<u>67,500</u>		

Table 7.3.1. Summary of Operation and Maintenance Cost of ADPP for Short Term

				(P'000)
Description	Unit	Q'ty	Amount	
A. Agricultural Development	lot	1	<u>36,450</u>	
B. Agricultural Infrastructure Development				
1) Irrigation Development	ha	455	1,275	
2) Drainage Development	"	310	775	
3) Rural Road Development	km	44.4	10,800	
4) Rural Water Supply Development	"	33.6	3,500	
5) Rural Electrification Development	"	40.8	450	
6) Rural Health Development	place	4	200	
7) Farmer's House Development	lot	1	150	
Sub-total of B)			<u>17,150</u>	
C. Post-Harvest/Marketing Service Assistance	lot	1	<u>4,950</u>	
D. Farmer's Organization Development	lot	1	<u>2,000</u>	
E. ADPC	lot	1	<u>40,250</u>	
<u>Total (A - E)</u>			<u>100,800</u>	
F. Land Acquisition and Compensation	lot	1	<u>54,200</u>	
<u>Total(A - F)</u>			<u>155,000</u>	

Table 7.3.2. Breakdown of Annual Operation and Maintenance Cost (1/2)

Description	Unit	Qty	Rate	(P'000)	
				Amount	Remark
1. Agricultural Development					
(Duration)					
1) Rice-Based Farming					
Irrigated	place	2	230	460	5Y
Rainfed	"	2	170	340	5Y
2) Corn-Based Farming	"	2	310	620	5Y
3) Coconut-Based Farming	"	2	590	1,180	5Y
4) Abaca Development					
Abaca Development	"	2	100	200	5Y
Abaca Seed Bank	"	1	420	420	5Y
5) Hillside Farming/Agro-Forestry Development	"	2	430	860	5 - 20Y
6) Livestock Development					
Animal Diagonos & Treatment Center	"	1	330	570	20Y
Gandara Breeding Station	"	1	60	60	10Y
Carabao Dispersal	"	2	10	20	10Y
Goat Dispersal	"	2	130	260	5Y
Duck Dispersal	"	2	210	420	5Y
Cockrel Dispersal	"	2	40	80	5Y
7) Nursery Station Development					
Gandara Seed Farm	"	1	360	360	5Y
Municipal Nursery	"	2	220	440	20Y
Crop Protection Facility	"	3	100	300	5Y
8) Freshwater Fish Culture Development					
Hatchery & Nursery Pond	"	1	500	500	20Y
Demonstration of Freshwater Fish Culture	"	2	100	200	20Y
<u>T o t a l</u>				<u>7,290</u>	
2. Irrigation Development					
20Y					
1) La Paz CIS	ha	145	0.4	60	
2) Quezon CIS	"	30	0.4	12	
3) Aurora CIS	"	10	0.4	4	
4) Bulao PIP	"	130	0.6	78	
5) Bulao South PIP	"	120	0.6	72	
6) Pologon CIS	"	20	0.4	8	
7) Water Level & Rain Gauge Sta.	place	10	2.1	21	
<u>T o t a l</u>				<u>255</u>	
3. Drainage Development					
20Y					
1) Drainage Canal	ha	310	0.5	155	
<u>T o t a l</u>				<u>155</u>	
4. Rural Road Development					
20Y					
1) Farm to Market Road	km	38.4	50	1,920	
2) Farm Road	"	6.0	40	240	
<u>T o t a l</u>				<u>2,160</u>	
5. Rural Water, Supply Development					
20Y					
1) Pipeline	km	33.6	10	336	
2) Related Facilities	lot	1		364	
<u>T o t a l</u>				<u>700</u>	

(Cont'd)

Table 7.3.2. Breakdown of Annual Operation and Maintenance Cost (2/2)

						(P'000)
Description	Unit	Q'ty	Rate	Amount	Remark	
6. Rural Electrification Development						20Y
1) Distribution Line	MWH	1,800	0.05	90		
<u>T o t a l</u>				<u>90</u>		
7. Rural Health Development						20Y
1) Solar Power Cold Chain System	place	4	10	40		
<u>T o t a l</u>				<u>40</u>		
8. Farmer's House Development						20Y
1) Model Farm House	place	2	15	30		
<u>T o t a l</u>				<u>30</u>		
9. Post-Harvest/Marketing Services Assistance						
1) Post-Harvest Facilities	lot	1		430		5Y
2) Rice Mill	"	1		240		5Y
3) Marketing Services Assistance	"	1		320		20Y
<u>T o t a l</u>				<u>990</u>		
10. Farmer's Organization Development	lot	1		400		20Y
<u>T o t a l</u>				<u>400</u>		
11. ADPC						
1) Building/Facility	lot	1		1,570		20Y
2) Administration	"	1		630		20Y
3) Laboratory	"	1		1,150		20Y
4) Farmer's Group Strengthening	"	1		2,300		10Y
5) Extension Services Strengthening	"	1		2,400		20Y
<u>T o t a l</u>				<u>8,050</u>		

CHAPTER 8. IMPLEMENTING PROGRAM

CHAPTER 8. IMPLEMENTING PROGRAM

8.1. Implementing Agency

The implementing agency of the Agricultural Development and Promotion Project (ADPP) is the Samar Integrated Rural Development Project (SIRDP), which has sufficient experiences over ten years on the project management and coordination in all provinces of the Samar island.

However, since the ADPP covers several sectors, technical assistance by sectoral line agencies concerned shall be extended to SIRDP during implementation of the project. Such sectoral line agencies are listed below;

- a) Agricultural Development DA, NFA, FIDA, PCA, DAR
- b) Infrastructural Development
 - Irrigation Development NIA
 - Drainage Development NIA
 - Rural Road Development DPWH
 - Rural Water Supply Development DPWH
 - Rural Electrification Development . NEA
 - Rural Health Development DOH
 - Farmer's House Development DA
- c) Post-Harvest/Marketing Development. DA, NFA
- d) Farmer's Organization Development . DA
- e) ADPCDA

8.2. Implementation Schedule

SIRDP should implement the project under the assistance of consultants in employing the sufficiently capable and well-experienced contractors on the contract basis.

The project could be implemented within 20 months after commencement of the detailed design. The seasonal weather conditions, namely the dry season and wet season, have been taken into consideration particularly for implementation of the irrigation, drainage, rural road and rural water supply development project.

The implementation schedule is as shown in Figure 8.1.1.

Figure 8.1.1.1. Implementation Schedule of ADPP

Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Preparation Work (Detail Design, Preparation of Tender, Tender and Contract)																				
Implementation																				
A. Agricultural Development																				
B. Infrastructural Development																				
Irrigation Development																				
Drainage Development																				
Rural Road Development																				
Rural Water Supply Development																				
Rural Electrification Development																				
Rural Health Development																				
Development of Farm House																				
C. Post Harvest/Marketing Development																				
D. Farmer's Organization Development																				
E. Agricultural Development Promotion Center (ADPC)																				
Consulting Services																				
Project Administration																				

CHAPTER 9. PROJECT EVALUATION

CHAPTER 9. PROJECT EVALUATION

9.1. Basic Concept

The Project aims to fulfill 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 been internationally established; hence, the economic feasibility and viability would hardly be anticipated. Therefore, the evaluation 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.

9.2. Methodology

9.2.1. Financial Analysis

As to the financial viability of the Project, farm budget analysis is estimated under present, "without" and "with" project situation. There exists three major farming systems in the area; namely, rice-based, corn-based and coconut-based farming systems, and toward each system, three farm household models are applied. Rice-based farming system is divided into two: rainfed and future irrigated.

The household consumption, land resources, production disposal, household expenditure and financial analysis was detailed for each household. The household consumption were adapted from Recommendable Dietary Allowance (RDA) per year for specific food groups and Annual per capita rates of food items, Eastern Visayas at the Food and Nutrition Research Institute, National Science Development Board, Manila. The RDA provides the metabolizable energy of 736,000 KCal per year.

The land resources in the present and the future situation are estimated based on the actual land holding area interviewed from many land-owners, part-owners and tenants in the area. In estimation of future land area, projected area expansion rate which express the percentage of uneffective land increase was used as 0.79% per annum for paddy area, 0.30% per annum for corn area, and 5.2% per annum for coconut area. These rates are sourced from NEDA, Region VIII, MAFO and DA, Catbalogan and PCA, Catbalogan, respectively.

The production disposal was estimated taking the family consumption patterns mentioned above, seed requirements for each crop, sales amount, and sharing amount with land-owner into account. The household expenditures was estimated by each farm model taking into account the production disposal.

The financial analysis was done by using the above mentioned data and the project shall be evaluated as family cash balance (total cash income minus total cash expenditure) and the fulfillment of nutritional intake, because the project will not improve the living standards of the rural poor unless the farm households are able to generate surplus cash for non-food expenditures coincided with the satisfaction of adequate dietary intake.

The four farming systems and 12 household models which were used in this financial analysis are shown in Table 9.2.1.

9.2.2. Economic Analysis

1) General

Economic analysis measures of the effect of the project from viewpoint of national economy. All the inputs and outputs which concern the project are valued at international border price. The major traded goods and services are valued at the marginal

Table 9.2.1. Farm Model Pattern in Present and Future Situation

Farming Systems/ Household Model	Number of Farm H.Hs. (1987)*	Farm Size	
		Present (1987) (ha)	Future (1992) (ha)
Rice Farms:			
1. Rainfed			
Owner-cultivator	60	2.20	2.32
Part-owner	120	1.40	1.41
Tenant	470	1.00	1.01
2. Future Irrigated			
Owner-cultivator	30	2.20	2.32
Part-owner	60	1.40	1.41
Tenant	310	1.00	1.01
Corn Farms:			
Owner-cultivator	20	3.30	3.47
Part-owner	40	2.70	2.87
Tenant	370	1.50	1.57
Coconut Farms:			
Owner-cultivator	30	5.40	6.32
Part-owner	50	3.70	4.33
Tenant	140	2.90	3.39

Note: * ... Assumed from the Census of Agriculture 1985 and adjusted using the result of Farm Economy Survey conducted by Study Team.

international prices taking into account the quality differential where applicable, and adjusted to economic costs allowing for transport, handling, storage and processing. The non-traded and minor traded goods and services are also converted to resource costs allowing for transportation charge excluded or subsidy and tax included.

To realize the full economic benefit of ADPP, the following conditions are essentially to be provided; viz., (i) completion of construction and expansion of all infrastructures, (ii) organic coordination between coordination agencies and implementation/technical agencies, (iii) appropriate operation and maintenance, and (iv) cooperative assistance from beneficiaries.

2) Economic benefits

Since all components are indispensable to attain the overall project benefits, it is not logical to analyze the discrete components as self-contained economic entities, therefore the estimation of benefits by project component is a theoretical exercise of little use.

The economic benefits accrue from infrastructure developments such as irrigation and drainage, roads and so on and agricultural developments, however, the bulk of benefits are taken from the latter developments.

The following are concept to be considered as economic benefit. The normal and generated traffic benefit (consumer surplus; vehicle operating cost-savings) are applicable in road improvement projects (11.9 km in total) and development benefit (producer surplus) which accrue from new road construction (26.5 km in total) are also estimated on road influence area (RIA) in terms of accelerated agricultural production.

The benefits from irrigation and drainage projects are measured from the incremental production value compared on "with" and "without" project conditions. The area covered by irrigation and drainage is 455 ha, which will convert from rainfed paddy area to irrigated paddy area with considerable cropping intensity and yield.

The economic benefits that can be expected from the water supply project will include the economic value of water, increase in income due to reduction in mortality and morbidity, activities due to savings in man-hours spent in fetching water.

The agriculture development benefits will be estimated in the same manner as irrigation and drainage projects mentioned above, based on the estimated cropping area, intensity and yields.

3) Pricing

Economic pricing is done based on World Bank primary commodity price forecasts (August 1987), which indicates the price projections of the major commodities until 2000, expressed in March 1987 constant dollars, converted to local currency at the official exchange rate of \$1.00 = ₱20.50. Economic prices used in this evaluation is adjusted to economic costs. The other conversion factors to apply to the costs for producing goods and services (not tariff in case of utilities and transport) are estimated based on the estimation by World Bank and ADB (refer to Appendix I).

9.3. Identification of Project Benefits

1) Beneficiaries

The population of the ADPP area is 12,359 (1987 estimate) of which 10,220 are engaged in farming activities. Most of the inhabitants of the area will benefit directly or indirectly from the project. The direct beneficiaries mainly consist of: (a) rice production farmers, (b) corn production farmers, and (c) coconut production farmers, totally estimated at 1,700 households. It is difficult to estimate the indirect beneficiaries of ADPP, however, an additional 100 full-time jobs will be created. The project will benefit not only the farmers but also the farm input dealers, the retailers, the students, etc., which will be hard to quantify.

2) Quantified and non-quantifiable benefits

The quantifiable benefits consist of incremental household income used in the financial analysis and the value of incremental crop production and so on used in the economic analysis.

Most part of the benefits accruing from the project are considered as indirect benefits but they are not included in the

estimation of the financial and economic benefits. These are called non-quantifiable benefits which cannot be expressed numerically.

The typical non-quantifiable benefits are shown below:

- Technical and institutional support to implementing agencies and the manpower training will upgrade the level of technical and managerial skills in the area. The additional crop and livestock outputs resulting from application of these skills cannot be quantified.
- Improvement in health care as a result of schistosomiasis control and the nutritional satisfaction were partly quantified, but the bulk of those cannot be quantified.
- Upgrade of standards of living through the rural electrification development was partly quantified, but the bulk of that cannot be quantified.
- Positive or negative benefits concerning the environment cannot be quantified.
- The substantial benefits of the drainage development cannot be quantified. The direct benefits from incremental crop production in the drainage development are not so much expected, however, the indirect benefits are substantial. The irrigation facilities, even if affected intermittently will not fully be effective without the provision of drainage systems, which will be effective for the schistosomiasis control. There are many casualties as well as damage of roads caused by floods every year in the area, therefore, drainage facilities are justifiable from the viewpoint of socio-economic benefits in both direct and indirect. The effects of the drainage systems on inhabitants' livelihood and health and alleviation of the constraint on development of irrigation systems are sufficiently able to justify the expenditures for the drainage projects.

3) Fulfillment of felt needs of inhabitants

The fulfillment of felt needs of inhabitants is not quantifiable, however, it is one of the most important index to evaluate this kind of BHN-oriented project, because the project components which would not be met with felt needs by the beneficiaries are the self-satisfaction of little use. The felt needs of inhabitants are endemic ones, however, the project covers their needs in detail, consequently the project can be considered as justifiable one (Refer to Table 9.3.1).

Table 9.3.1. Essential Development in Barangay

<u>Name of Barangay</u>	<u>Priority No.1</u>	<u>Priority No.2</u>	<u>Priority No.3</u>
- Gandara Municipality -			
1. Gandara Poblacion	Water Supply *	Agriculture*	Clinic*
2. Ngoso	River Control	Irrigation	Waiting Shed
3. Diaz	Irrigation Pump	Water Supply*	School
4. San Miguel	Agriculture*	Road*	Water Supply
5. San Agustin	River Control	Irrigation	Water Supply*
6. Hinogacan	Water Supply*	School	Clinic
7. Pologon	Water Supply*	School	Clinic
- San Jorge Municipality -			
1. Tomogbong	Road*	Agriculture*	Power Supply
2. Blanca Aurora	Road*	Agriculture*	Water Supply*
3. Himay	Irrigation	Water Supply*	Road*
4. Buenavista	Agriculture*	Water Supply*	River Control
5. Sinibaran	Water Supply	Agriculture*	Road*
6. Cantaguic-Ranera	Agriculture*	Road*	Irrigation
7. Rawis	Agriculture	Road*	Irrigation
8. San Isidro	Water Supply	Road*	Agriculture
9. Bulao	River Control	Agriculture*	Water Supply*
10. La Paz	Agriculture*	Road*	Irrigation*
11. Monbon	Water System*	Road*	Agriculture*
12. Sapinit-Anquiána	Road*	School	Agriculture*
13. San Jorge-Manco	Irrigation	Agriculture*	Water Supply*
14. Erenas	Irrigation	Road*	Agriculture*
15. San Juan	Agriculture*	Road*	Water Supply*
16. Puhagan	Road*	Agriculture*	Water Supply
17. Rosalim	Irrigation*	Water Supply	Flood Control
18. Aurora-Mabuhay	Road*	Agriculture*	Water Supply
19. Canyaki	Agriculture*	Road*	Irrigation
20. Quezon	Irrigation*	Agriculture*	Road*

Note: Interviewed from Barangay Captains on 22nd June, 1988 in Gandara Municipality and on 18th June, 1988 in San Jorge Municipality.

* ... already realized under "with" project situation.

Source: Farm Economy Survey conducted by Study Team.

9.4. Quantification of Economic Costs and Benefits

The direct quantified costs and benefits are included for the purpose of estimating the economic internal rate of return (EIRR) on the project and major components. The project costs are included in the calculation of the EIRR for the overall project.

The total economic cost of the project is amounted at 473 million pesos, of which 198 million pesos is for project management, 34 million pesos for agricultural development, 65 million pesos for road development, 34 million pesos for irrigation development, 72 million pesos for drainage development, 55 million pesos for rural water supply development, five million pesos for rural electrification development and ten million pesos for other incidental development, respectively. The economic costs include the physical contingencies. The annual economic operation and maintenance costs (economic recurrent costs) amount to eight million pesos after completion of the project.

The quantified direct benefits accruing from each project component are summarized in succeeding page.

The main assumptions which are used in this economic evaluation are as follows;

- The economic project life is 20 years,
- Two-year implementation period is required from 1989.
- In case of agricultural development, four years are required to attain full benefit after completion of the project. The full benefit is distributed to 25% for the first year, 50% for the second year and 75% for the third year.
- The financial project cost (local currency costs) is adjusted by standard, group and specific conversion factors to reflect economic cost.
- The farm gate economic prices of major traded commodities are based on the World Bank primary price forecasts which expresses the price projections until 2000, and allowed for marketing and processing cost.

- The farm gate economic costs of minor traded goods (both inputs and outputs) and non-traded commodities are based on the financial cost.
- The economic cost of unskilled labor is based on financial cost adjusted to reflect the opportunity cost by using the standard conversion factor.
- The economic cost of skilled labor is equal to the financial costs.
- No residual value is considered for facilities or equipment provided under the Project.
- No replacement cost is considered throughout the project life.

9.4.1. Rural Road Development Benefits

1) Normal and generated traffic benefit (Consumer surplus)

The benefits of the road improvement project (11.9 km) accrue from the reduction (savings) in the economic cost of transport, comparing the without and with project situation. In accordance with theory, normal passenger and cargo traffic receive the full benefit of the transport cost reduction, while generated traffic receives 1/2 the reduction. To estimate the benefit the following assumptions were made.

- Population growth rate is adopted at 0.47% of the compound rate.
 - Per capita income growth rate per annum is 10.0%
 - Cargo traffic growth rate per annum is 5.0%
 - Average daily traffic volume is assumed at 25 jeepneys, 10 small bus, 10 cars and 5 small trucks.
 - Transport-income elasticity is 1.2%
 - Economic vehicle operating cost including passenger time for each vehicle type is adopted the such shown in Table
- 9.4.1.

The vehicle operating cost savings are calculated by using the aforesaid assumptions as 1,160 thousand pesos for 1989 and 2,834 thousand pesos for 2007 and generated traffic cost savings in 1989 and 2007 were 85 thousand pesos and 841 thousand pesos, respectively. The values for intervening years were extrapolated proportionally (refer to Table 9.5.6).

2) Development benefit (Producer surplus)

The benefits of new road construction (26.5 km) is estimated as development benefit which arise from increased agricultural production induced by removing the constraint in the access.

The value of benefit is estimated through the net value added technique. The road influence area (RIA) was estimated at 5,300 ha of which 702 ha was considered as RIA with accruing agricultural benefit. The net value of production was calculated in a same manner as agriculture development benefit shown in below, and the net incremental value of production at full development was estimated at 5,585 thousand pesos (refer to Table 9.5.6).

9.4.2. Agricultural Development Benefit

The direct benefit of the agricultural development project is calculated based on the proposed cropping intensity, yields and areas in the present and the future situation, allowing for the economic cost of crop inputs and outputs (refer to Appendix I).

The net economic value of production in the future situation amounts to five million pesos under the without project situation and to 26 million pesos under the with project situation, respectively and annual net incremental value of production at full development is estimated at 21 million pesos (refer to Tables 9.4.2 and 9.5.5).

9.4.3. Irrigation Development Benefit

The quantification of the direct benefit for the irrigation development project is made in the same manner as the agricultural development project mentioned above.

The net economic value of production in the future situation amounts to two million pesos under the without project situation and eight million pesos under the with project situation, respectively and annual net incremental value of production at full development is estimated at six million pesos (refer to Table 9.5.9).

9.4.4. Rural Water Development Benefit

The economic benefit that can be expected from the project shall include the economic value of water, increase in income due to reduction in mortality and morbidity, savings in medical expenses, increased time for productive activities due to savings in man-hour spent in fetching water, benefits from income redistribution effects, and increases in productivity due to availability of water as input for household economic activities and others.

1) The economic value of water

This benefit can be measured by the willingness of household to pay for potable water supply and is reflected in the water fees. According to LWUA, willingness to pay is 15.13 pesos or 0.86% of monthly income for public faucets. Therefore, the annual economic value of water (EVW) for the project can be estimated at 352 thousand pesos allowing for 1,941 of served households for the Project (refer to Table 9.5.8).

2) Increase in income due to reduction of mortality

With the increase of quantity and improved water quality provided by the project, the mortality level from water-borne diseases can be reduced. With the project situation, mortality and morbidity levels are projected to decrease by 40%. The direct benefit that can be generated by the reduction in the mortality rates can be quantified by savings in man-days that would be lost due to death caused by the incidence of water related diseases.

These savings in man-days shall be adjusted by 50%, since all potential death from water-borne diseases can not be considered as death of economically active persons. A portion of the potential death may be included infants, children and women. On the other hand, women and children in the rural areas contribute to economic activities. The future income of children whose potential death are prevented by provision of potable water is excluded in the estimation of this benefit.

The direct benefit above-mentioned is estimated at 61 thousand pesos allowing for 59 of morbidity caused by Gastro-Enteritis in 1986 and 19.89 pesos of economic price of unskilled labor under the with project situation (refer to Table 9.5.8).

3) Increase in income due to reduction of morbidity

With the project, morbidity level can be expected to be likewise reduced by 40%. To quantify the economic benefit from the reduction of the morbidity level, the following formula shall be adopted.

$$\begin{aligned} \text{IMB} &= Y_1 - Y_2 \\ Y_1 &= \text{NM}/2 \times \text{AD} \times \text{MWD} \\ Y_2 &= (1 - 0.4)/2 \times \text{NM} \times \text{AD} \times \text{MWD} \end{aligned}$$

where;

- IMB - Annual economic benefits from the reduced morbidity level
- Y_1 - annual economic losses of economically active population who are deemed inactive as a result of the morbidity caused by the water-borne diseases under the without project situation,
- Y_2 - same as above under the with project situation
- NI - numbers of reported morbidity cases due to the water-borne diseases.
- AD - average number of days a person afflicted with the water-borne disease in inactive (or 4 days) (San Lazaro Hospital)
- MWD - economic price of unskilled labor under the with project situation (₱19.89)

IMB is estimated of 34 thousand pesos annually (refer to Table 9.5.8).

4) Savings in medical expenses

Savings in medical expenses can result from a reduction in the incidence of the water-borne diseases with the availability of potable water supply. To estimate the economic benefit, the following formula is given.

$$SV = ME1 - ME2$$

$$ME1 = NC \times \text{₱}2,000$$

$$ME2 = (1 - 0.40) NC \times \text{₱}2,000$$

where,

- SV - Savings in annual medical expenses for the water-borne diseases
- ME1 - total medical expenses for the water borne diseases without the project
- ME2 - same as above with the project
- NC - number of reported cases on the water-borne diseases in the service area

According to San Lazaro Hospital in Manila, the cost of diagnosis and treatment of all types of the water-borne diseases is 2,000 pesos per patient at minimum. Although persons afflicted with these diseases may get free medical cure, the full cost is inputted

in the calculation as benefit since government expenses in the control of the water-related diseases are considered as real economic resources that could be saved as a result of the Project.

The annual economic value for savings in medical expenses by the project is estimated at 1,724 thousand pesos (refer to Table 9.5.8).

5) Increased time for productive activities

The project will generate savings in man-days to be spent in fetching water as a result of improved distance between the water source and the households, which can be utilized for household economic activities. To measure this benefit, the following formula was used.

$$IT = HH \times TD \times MWD$$

where;

- IT - annual economic benefit from savings in man-days to be spent in fetching water
- HH - number of households in the service area
- TD - annual time savings in man-days per households
- MWD - economic price of unskilled labor under the with project situation (₱19.89)

The computed economic benefit from time saved due to improved distance between the household and the water source shall assume that only 40% of real time saved shall actually utilized for economic activities. The rest shall be spent for leisure and other non-productive activities. Also implied in the assumption is the fact that drawers of water contribute to economic activities. In the area, the drawers of water are usually women and children, both are generally found to contribute to farm work or other economic activities. In computing for time savings, an 8-hour work per day is assumed and time savings on weekends are excluded.

The estimated economic value for the above benefit are computed at 98 thousand pesos annually (refer to Table 9.5.8).

6) Water charge analysis

The water charge per gallon is calculated as follows;

- Service Population	11,259
- No. of Families	1,941
- Water Demand per Family	3,480 (1,061 families)
- Per month (gallon)	2,610 (880 families)
- Development Cost ('000 pesos)	84,600
- O/M Cost ('000 pesos)	700
- Annual Repayment* ('000 pesos)	9,371
- Monthly Repayment per Family (pesos)	402
- Water Charge (pesos/gallon)	0.13

Note: *... Ten percent of annual interest and three years grace period is considered. Disbursement period is from the fourth year to the 23rd year (for 20 years).

9.4.5. Rural Electrification Development Benefit

The direct benefit for the rural electrification development was measured by the value which accrue from the savings of kerosine. In the area, the monthly expense for kerosine is at 90 pesos on an average for non-energized families, and it is assumed that these expenses would not occur under with project situation.

The financial price of kerosine can be assumed as economic price, therefore economic cost savings for one family is considered as 90 pesos per month.

The annual direct benefit of the project at full development year is calculated at 755 thousand pesos in taking into consideration the 699 households in 2000. Four years are considered to attain the full benefit after the completion of the Project (refer to Table 9.5.9).

9.5. Financial and Economic Evaluations

9.5.1. Financial Evaluation

The annual net household income of 12 models show the mushroom growth under with project situation. It is expected that the annual household income under with project situation will increase ranging from 143% to 231% of that under the present situation. The highest increase is realized in the owner-cultivator on a coconut production farm and the lowest increase is in the tenant on a rainfed rice production farm (refer to Table 9.5.1).

Measures of family cash balance indicate that rural households will increase significantly their disposable cash income for non-food expenditures such as clothing, education, medicine, transport and recreation. The project will create the disposable cash income except the tenant on a rainfed rice farm (refer to Table 9.5.2).

The project will allow to improve nutrition levels and change food consumption pattern to a more balanced diet. Eleven household models out of 12 will be able to intake the recommendable dietary allowance (RDA), consequently, result in decreasing of malnutrition rate and infant mortality. The tenant on a rainfed rice production farm is the only one which cannot reach the RDA, however, it could be improved if irrigation water would be provided in middle or long-term development period (refer to Table 9.5.3).

The improvement of the household income is attained due to the augmentation of their farm income. The highest increase of annual net farm income at 283% is achieved by the part-owner on a coconut production farm. The considerable increase can be observed even in the part-owner and tenant models, therefore, the project is concluded as financially viable. (refer to Table 9.5.4)

9.5.2. Economic Analysis

The overall project Economic Internal Rate of Return (EIRR) is estimated at 5.5 %. About 50% of the project benefit is attributable to agriculture development and the remnant accrue from the other project components (refer to Tables 9.5.5 to 9.5.13).

The sectoral project EIRR is calculated as below, however, these EIRRs are theoretical one of no significance because their project benefits cannot accrue unless all components of the project would be combined.

<u>Sector</u>	<u>EIRR (%)</u>
Agriculture Development	7.0
Road Development	6.9
Rural Electrification	11.3
Rural Water Supply	below 1.0
Irrigation Development	11.4

The project EIRR is low compared to other rural development projects and this is one of the typical characteristics of BHN-oriented project.

9.5.3. Sensitivity Analysis

The sensitivity analysis highlighted the effects of changes in parameters as follows:

	<u>EIRR (%)</u>
- Base Case	5.5
- Two-Year Delay in Benefit Accrual	3.4
- Five-Year Delay in Benefit Accrual	less than 1.0
- Benefit minus ten percent	4.1
- Cost plus ten percent	4.6
- Two-Year Delay in Project Commencement	4.7
- Five-Year Delay in Project Commencement	2.7

The project EIRR is the most sensitive to delay in the accrual of benefits incurred from slower expansion activities. EIRR declines from 5.5% in base case to 3.4% in two-year delay and to below 1% in five-year. A ten percent decline in benefits due to price or yield decreases results in EIRR falling from 5.5% to 4.1%. An increase in costs has a little impact on EIRR.

Table 9.4.1. Economic Vehicle Operating Costs
Pesos Per Kilometer
(Operating + Fixed + Time)
1987 *

Vehicle Type	Paved				Gravel				Stone	Earth	
	Good	Fair	Bad	Very Bad	Good	Fair	Bad	Very Bad	Very Bad	Bad	Very Bad
Car/Jeep	1.14	1.34	1.77	2.40	1.43	1.77	2.19	2.69	3.78	2.69	3.63
Jeepney/Van	1.38	1.62	2.35	3.31	1.67	2.05	2.73	3.58	5.73	3.58	5.58
Small Bus	2.33	2.73	4.09	5.78	2.78	3.42	4.66	6.19	10.17	6.19	9.94
Large Bus	4.26	5.00	7.65	10.94	5.05	6.16	8.58	11.60	19.71	11.60	19.35
Truck	2.92	3.29	4.52	6.15	3.68	4.53	5.60	6.91	9.60	6.91	9.27
Large Truck	2.69	3.16	4.26	5.87	3.36	4.14	5.20	6.53	9.51	6.53	9.15
Motor Tricycle	0.57	0.66	0.95	1.58	0.71	0.85	1.10	1.68	2.82	1.68	2.77
Motor Cycle	0.37	0.43	0.61	0.90	0.47	0.58	0.75	1.00	1.47	1.00	1.42

* Converted to constant price of 1987 from 1982 adopting WB manufacturing unit value index of 1.265.

Table 9.4.2. Agricultural Development Benefits
at Full Development

Area/Crop	Net Value of Production		Net Incremental Value of Production
	Without Project	With Project	
Rainfed Lowland	(525 ha)	(545 ha)	
- Paddy (Wet & Dry)	2,042	2,280	238
- Mongokean	-	360	360
- Telapia	-	695	695
Corn Land	(540 ha)	(540 ha)	
- Corn	1,852	5,863	4,011
- Peanut	-	1,815	1,815
Coconut Land	(800 ha)	(800 ha)	
- Coconut	1,023	6,550	5,527
- Corn/Upland Rice	-	513	513
- Peanut	-	672	672
- Sweet Potato	-	891	891
- Black Pepper	-	2,918	2,948
Hillside Farming Land	(0 ha)	(300 ha)	
- Corn/Upland Rice	-	349	349
- Cassaba	-	1,551	1,551
- Pilint	-	252	252
Abaca Land	(40 ha)	(200 ha)	
- Abaca	11	1,251	1,240
Total	4,928	26,020	21,092
Irrigated Lowland	(455 ha)	(455 ha)	
- Paddy (Dry & Wet)	1,667	6,987	5,320
- Vegetable	-	588	588
Total	1,667	7,575	5,908

* 40% of benefits are assumed in sectoral analysis.

Table 9.5.1. Annual Household Income *

Household Model	Present (1987)	With Project (1992)	(unit: pesos or %) Percentage Increase
<u>Rice Production Farm</u>			
1. Rainfed:			
Owner-cultivator	19,210	34,810	181
Part-owner	10,328	17,246	167
Tenant	8,074	11,541	143
2. Future Irrigated:			
Owner-cultivator	19,210	37,460	195
Part-owner	10,328	17,613	171
Tenant	8,074	12,672	157
<u>Corn Production Farm</u>			
Owner-cultivator			
Part-owner	19,792	41,036	207
Tenant	11,539	21,814	189
	8,208	13,678	167
<u>Coconut Production Farm</u>			
Owner-cultivator			
Part-owner	21,499	49,629	231
Tenant	11,221	25,820	230
	9,520	20,684	217

Note: * ... Household Income is defined as the sum of net farm income, net off-farm income and net non-farm income.

Table 9.5.2. Annual Family Cash Balance

Household Model	Present (1987)	With Project (1992)	(unit: pesos or %) Percentage Increase
<u>Rice Production Farm</u>			
1. Rainfed -			
Owner-cultivator	300	11,100	1,387
Part-owner	0	1,000	n.a.
Tenant	0	0	n.a.
2. Future Irrigated			
Owner-cultivator	300	13,000	4,333
Part-owner	0	1,800	n.a.
Tenant	0	400	n.a.
<u>Corn Production Farm</u>			
Owner-cultivator			
Part-owner	200	13,400	6,700
Tenant	0	4,100	n.a.
	0	300	n.a.
<u>Coconut Production Farm</u>			
Owner-cultivator			
Part-owner	400	22,300	5,575
Tenant	0	6,300	n.a.
	0	1,800	n.a.

Note: n.a. = not applicable.

Table 9.5.3. Improvement of Nutritional Condition

Household Model	Present (1987)		(unit: pesos or %)		Present (1987)	With Project (1992)	(unit: pesos or %) Percentage Increase
	Without Project (1992)	With Project (1992)	Without Project (1992)	With Project (1992)			

<u>Rice Production Farm</u>							
1. Rainfed ~							
Owner-cultivator	0	0	0	0	15,500	31,100	201
Part-owner	X	X	0	0	7,098	14,246	201
Tenant	X	X	X	X	4,844	8,311	172
2. Future Irrigated							
Owner-cultivator	0	0	0	0	15,500	33,750	218
Part-owner	X	X	0	0	7,098	14,383	203
Tenant	X	X	0	0	4,844	9,442	195

<u>Corn Production Farm</u>							
Owner-cultivator	0	0	0	0	16,082	37,326	232
Part-owner	X	X	0	0	8,309	18,584	224
Tenant	X	X	X	X	4,978	10,448	210

<u>Coconut Production Farm</u>							
Owner-cultivator	0	0	0	0	17,789	45,919	258
Part-owner	X	X	0	0	7,991	22,590	283
Tenant	X	X	0	0	6,290	17,454	277

Note: Symbol "0" shows the conditions of nutritionally adequate, while symbol "X" shows the condition of nutritionally inadequate.

Table 9.5.4. Annual Net Farm Income*

Household Model	Present (1987)	With Project (1992)	(unit: pesos or %) Percentage Increase
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<u>Rice Production Farm</u>			
1. Rainfed ~			
Owner-cultivator	15,500	31,100	201
Part-owner	7,098	14,246	201
Tenant	4,844	8,311	172
2. Future Irrigated			
Owner-cultivator	15,500	33,750	218
Part-owner	7,098	14,383	203
Tenant	4,844	9,442	195

<u>Corn Production Farm</u>			
Owner-cultivator	16,082	37,326	232
Part-owner	8,309	18,584	224
Tenant	4,978	10,448	210

<u>Coconut Production Farm</u>			
Owner-cultivator	17,789	45,919	258
Part-owner	7,991	22,590	283
Tenant	6,290	17,454	277

* ... Net farm income is defined as market production plus family consumption (of farm production) minus payment to land-owner (if applicable) plus seed production minus total production costs.

Table 9.5.5. Agricultural Development:
Economic Costs and Benefit

Year	Incremental			O/M	Total		Net
	Benefit	Costs	Costs		Costs	Benefit	
1987	0	0	14,470	0	14,470	-14,470	
1988	0	0	27,215	0	-27,215	-27,215	
1989	2,109	0	1,319	1,319	0	790	
1990	4,218	0	2,082	2,082	0	2,136	
1991	6,328	0	2,845	2,845	0	3,485	
1992	8,436	0	3,608	3,608	0	4,828	
1993	8,436	0	3,608	3,608	0	4,828	
1994	8,436	0	3,608	3,608	0	4,828	
1995	8,436	0	3,608	3,608	0	4,828	
1996	8,436	0	3,608	3,608	0	4,828	
1997	8,436	0	3,608	3,608	0	4,828	
1998	8,436	0	3,608	3,608	0	4,828	
1999	8,436	0	3,608	3,608	0	4,828	
2000	8,436	0	3,608	3,608	0	4,828	
2001	8,436	0	3,608	3,608	0	4,828	
2002	8,436	0	3,608	3,608	0	4,828	
2003	8,436	0	3,608	3,608	0	4,828	
2004	8,436	0	3,608	3,608	0	4,828	
2005	8,436	0	3,608	3,608	0	4,828	
2006	8,436	0	3,608	3,608	0	4,828	
2007	8,436	0	3,608	3,608	0	4,828	

EIRR = 7.01 %

Table 9.5.6. Road Development:
Economic Costs and Benefit

Year	Normal		Generated		Project	O/M	Total		Net
	Benefits	Costs	Benefits	Costs			Costs	Benefit	
1987	0	0	0	0	27,535	0	0	0	-27,535
1988	0	0	0	0	37,111	0	0	0	-37,111
1989	1,150	85	1,396	0	864	864	2,641	1,777	3,309
1990	1,253	127	2,793	0	864	864	4,173	4,840	6,371
1991	1,346	169	4,189	0	864	864	5,704	6,506	8,126
1992	1,439	211	5,585	0	864	864	7,235	8,126	9,517
1993	1,532	253	6,971	0	864	864	8,765	9,517	10,908
1994	1,625	295	8,357	0	864	864	10,305	10,908	11,700
1995	1,718	337	9,743	0	864	864	11,845	11,700	12,491
1996	1,811	379	11,129	0	864	864	13,385	11,700	13,282
1997	1,904	421	12,515	0	864	864	14,925	11,700	14,073
1998	1,997	463	13,901	0	864	864	16,465	11,700	14,864
1999	2,090	505	15,287	0	864	864	18,005	11,700	15,655
2000	2,183	547	16,673	0	864	864	19,545	11,700	16,446
2001	2,276	589	18,059	0	864	864	21,085	11,700	17,237
2002	2,369	631	19,445	0	864	864	22,625	11,700	18,028
2003	2,462	673	20,831	0	864	864	24,165	11,700	18,819
2004	2,555	715	22,217	0	864	864	25,705	11,700	19,610
2005	2,648	757	23,603	0	864	864	27,245	11,700	20,401
2006	2,741	799	24,989	0	864	864	28,785	11,700	21,192
2007	2,834	841	26,375	0	864	864	30,325	11,700	21,983
2008	2,920	876	27,761	0	864	864	31,865	11,700	22,774

EIRR = 6.89 %

Table 9.5.7. Rural Electrification Development:
Economic Costs and Benefits

Year	Incremental		Project	O/M	Net	
	Benefit	Cost			Benefit	Cost
1987	0	0	4,684	0	-4,684	
1988	189	0	0	36	153	
1989	378	0	0	36	342	
1990	566	0	0	36	530	
1991	755	0	0	36	719	
1992	755	0	0	36	719	
1993	755	0	0	36	719	
1994	755	0	0	36	719	
1995	755	0	0	36	719	
1996	755	0	0	36	719	
1997	755	0	0	36	719	
1998	755	0	0	36	719	
1999	755	0	0	36	719	
2000	755	0	0	36	719	
2001	755	0	0	36	719	
2002	755	0	0	36	719	
2003	755	0	0	36	719	
2004	755	0	0	36	719	
2005	755	0	0	36	719	
2006	755	0	0	36	719	
2007	755	0	0	36	719	

EIRR = 11.26%

Table 9.5.8. Rural Water Supply Development: Economic Costs and Benefit
(P'000)

Year	Economic Value of Water	Mortality Decrease	Morbidity Decrease	Medical Savings	Increased Time	Total Benefit	Project Cost	O/M Cost	Net Benefit
1987	0	0	0	0	0	0	27,464	0	-27,464
1988	0	0	0	0	0	0	27,464	0	-27,464
1989	352	0	0	0	98	450	0	280	170
1990	352	0	0	431	98	881	0	280	601
1991	352	0	0	862	98	1,312	0	280	1,032
1992	352	0	0	1,293	98	1,743	0	280	1,463
1993	352	61	34	1,724	98	2,269	0	280	1,989
1994	352	61	34	1,724	98	2,269	0	280	1,989
1995	352	61	34	1,724	98	2,269	0	280	1,989
1996	352	61	34	1,724	98	2,269	0	280	1,989
1997	352	61	34	1,724	98	2,269	0	280	1,989
1998	352	61	34	1,724	98	2,269	0	280	1,989
1999	352	61	34	1,724	98	2,269	0	280	1,989
2000	352	61	34	1,724	98	2,269	0	280	1,989
2001	352	61	34	1,724	98	2,269	0	280	1,989
2002	352	61	34	1,724	98	2,269	0	280	1,989
2003	352	61	34	1,724	98	2,269	0	280	1,989
2004	352	61	34	1,724	98	2,269	0	280	1,989
2005	352	61	34	1,724	98	2,269	0	280	1,989
2006	352	61	34	1,724	98	2,269	0	280	1,989
2007	352	61	34	1,724	98	2,269	0	280	1,989

Less than
EIRR = 1 %

Table 9.5.9. Irrigation Development:
Economic Costs and Benefit
(P'000)

Year	Incremental Benefit	Project Costs	O/M Costs	Total Costs	Net Benefit
1987	0	22,903	0	22,903	-22,903
1988	0	11,452	0	11,452	-11,452
1989	1,477	0	124	124	1,353
1990	2,954	0	124	124	2,830
1991	4,431	0	124	124	4,307
1992	5,908	0	124	124	5,784
1993	5,908	0	124	124	5,784
1994	5,908	0	124	124	5,784
1995	5,908	0	124	124	5,784
1996	5,908	0	124	124	5,784
1997	5,908	0	124	124	5,784
1998	5,908	0	124	124	5,784
1999	5,908	0	124	124	5,784
2000	5,908	0	124	124	5,784
2001	5,908	0	124	124	5,784
2002	5,908	0	124	124	5,784
2003	5,908	0	124	124	5,784
2004	5,908	0	124	124	5,784
2005	5,908	0	124	124	5,784
2006	5,908	0	124	124	5,784
2007	5,908	0	124	124	5,784

EIRR = 11.36 %

Table 9.5.10. The Economic Project Cost*
(P'000)

Year	Agriculture Development	Irrigation Development	Rural Road	Water Supply	Rural Electrification	Others Component	Total
1987	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0
1989	5,273	1,477	2,288	450	189	0	9,677
1990	10,546	2,954	3,466	881	378	0	18,225
1991	15,819	4,431	4,643	1,312	566	0	26,771
1992	21,089	5,908	5,821	1,743	755	0	35,316
1993	21,089	5,908	5,856	2,269	755	0	35,977
1994	21,089	5,908	6,091	2,269	755	0	36,112
1995	21,089	5,908	6,226	2,269	755	0	36,247
1996	21,089	5,908	6,361	2,269	755	0	36,382
1997	21,089	5,908	6,496	2,269	755	0	36,517
1998	21,089	5,908	6,631	2,269	755	0	36,652
1999	21,089	5,908	6,766	2,269	755	0	36,787
2000	21,089	5,908	6,901	2,269	755	0	36,922
2001	21,089	5,908	7,036	2,269	755	0	37,057
2002	21,089	5,908	7,171	2,269	755	0	37,192
2003	21,089	5,908	7,306	2,269	755	0	37,327
2004	21,089	5,908	7,441	2,269	755	0	37,462
2005	21,089	5,908	7,576	2,269	755	0	37,597
2006	21,089	5,908	7,711	2,269	755	0	37,732
2007	21,089	5,908	7,846	2,269	755	0	37,867

* The economic cost for project management is excluded.

Table 9.5.11. The Economic O/M Cost for Overall Project
(P'000)

Year	Agriculture Development	Irrigation Development	Rural Road	Water Supply	Rural Electrification	Others Component	Total
1987	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0
1989	763	124	864	280	36	3,844	5,911
1990	1,526	124	864	280	36	3,844	6,674
1991	2,129	124	864	280	36	3,844	7,437
1992	3,052	124	864	280	36	3,844	8,200
1993	3,052	124	864	280	36	3,844	8,200
...
2007	3,052	124	864	280	36	3,844	8,200

Table 9.5.13. The Overall Project: Economic Costs and Benefits
(P'000)

Year	Incremental		Project		O/M		Total		Net Benefits
	Benefits	Costs	Costs	Benefits	Costs	Benefits	Costs		
1987	0	0	140,365	0	0	140,365	0	0	-140,365
1988	0	0	135,269	0	0	135,269	0	0	-135,269
1989	9,677	0	0	0	5,911	5,911	5,911	5,911	3,766
1990	18,225	0	0	0	6,674	6,674	6,674	6,674	11,551
1991	26,771	0	0	0	7,437	7,437	7,437	7,437	19,334
1992	35,316	0	0	0	8,200	8,200	8,200	8,200	27,116
1993	35,977	0	0	0	8,200	8,200	8,200	8,200	27,777
1994	36,112	0	0	0	8,200	8,200	8,200	8,200	27,912
1995	36,247	0	0	0	8,200	8,200	8,200	8,200	28,047
1996	36,382	0	0	0	8,200	8,200	8,200	8,200	28,182
1997	36,517	0	0	0	8,200	8,200	8,200	8,200	28,317
1998	36,652	0	0	0	8,200	8,200	8,200	8,200	28,452
1999	36,787	0	0	0	8,200	8,200	8,200	8,200	28,587
2000	36,922	0	0	0	8,200	8,200	8,200	8,200	28,722
2001	37,057	0	0	0	8,200	8,200	8,200	8,200	28,857
2002	37,192	0	0	0	8,200	8,200	8,200	8,200	28,992
2003	37,327	0	0	0	8,200	8,200	8,200	8,200	29,127
2004	37,462	0	0	0	8,200	8,200	8,200	8,200	29,262
2005	37,597	0	0	0	8,200	8,200	8,200	8,200	29,397
2006	37,732	0	0	0	8,200	8,200	8,200	8,200	29,532
2007	37,867	0	0	0	8,200	8,200	8,200	8,200	29,667

EIRR = 5.54%

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