G.1.2 Development Program and Target

1) Future road network

Figure G.1.4 Future Road Network

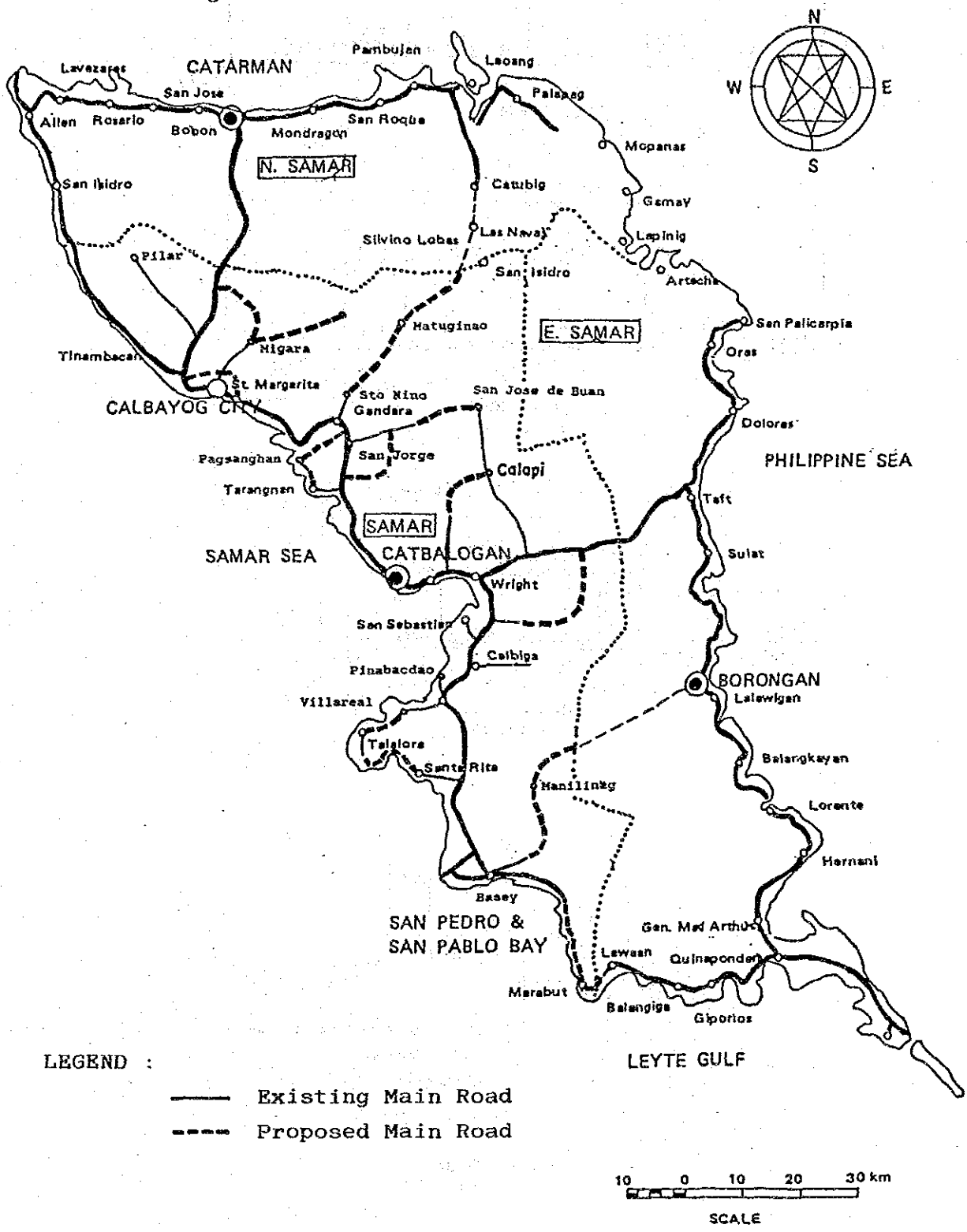
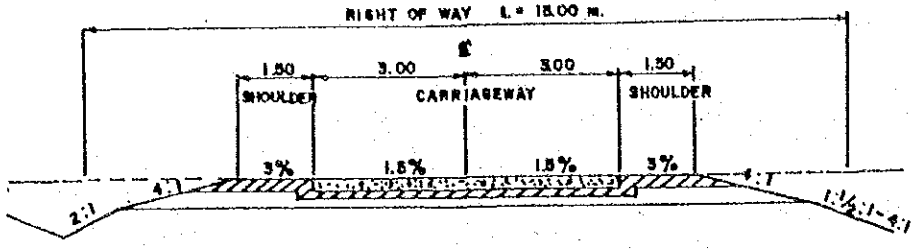
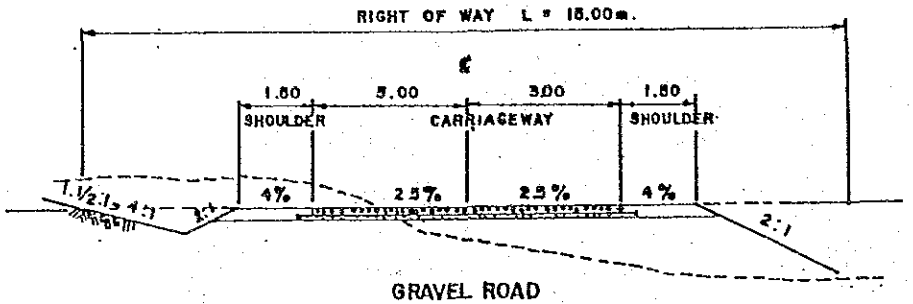


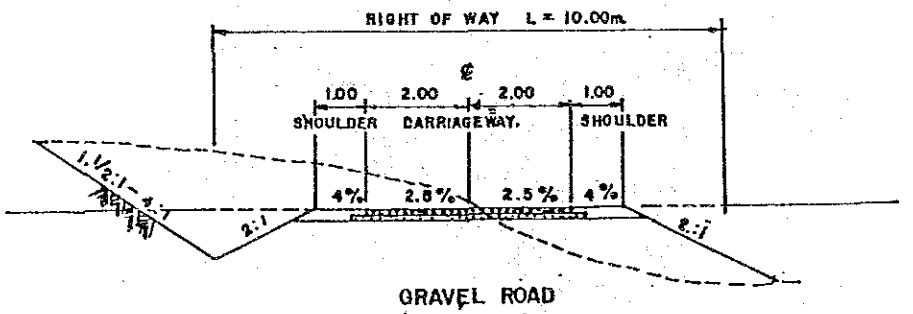
Figure G.1.5 Typical Road Section



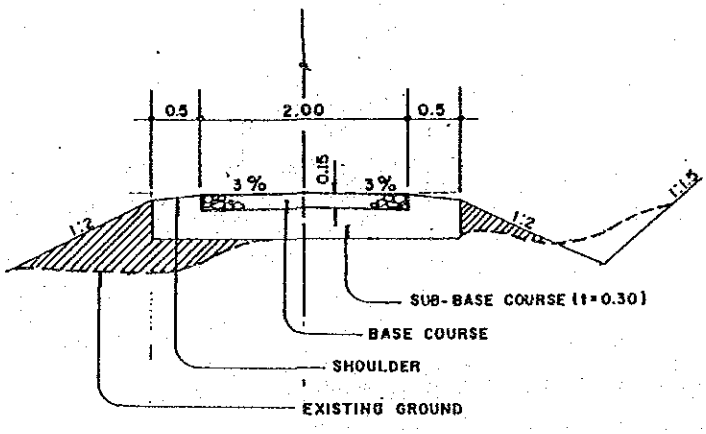
CONCRETE ROAD
(TYPE-A)



GRAVEL ROAD
(TYPE-B)



GRAVEL ROAD
(TYPE-C)



GRAVEL ROAD
(TYPE-D)

2) Development program

Table G.1.7 Quantity of Roads and Bridges

(Unit:Km)

	Improvement			Construction			
	Type-A	Type-B	Type-C	Type-A	Type-B	Type-C	Type-D
1.Road	210.0	70.0	250.0	50.0	80.0	680.0	150.0
Sub total		530.0			810.0		(150.0)
TOTAL	1,340.0 Km						

2.Bridge Total = 4,400 L.M.
Long Span Bridge:160 L.M., Basey River
140 L.M., Legaspi River

Note: 1/ Type-A is Concrete road (width=6.0m).
2/ Type-B is Gravel road (width=6.0m).
3/ Type-C is Gravel road (width=4.0m).
4/ Type-D is Gravel road (width=2.0m).
5/ Bridges are Reinforced Concrete and non-composite beam girder.

Source : JICA Study Team, 1987

Table G.1.8 Development Program

(Unit:Km)

Item	Improvement				Construction			
Type	S.T	M.T	L.T	Total	S.T	M.T	L.T	Total
A	10.0	-	200.0	210.0	30.0	20.0	-	50.0
B	70.0	-	-	70.0	40.0	-	40.0	80.0
C	130.0	120.0	-	250.0	50.0	200.0	430.0	680.0
TOTAL	210.0	120.0	200.0	530.0	120.0	220.0	470.0	810.0
D	-	-	-		30.0	40.0	80.0	150.0
Bridge					1,100m	1,700m	1,600m	4,400m

Note: 1/ S.T means Short Term Program.
2/ M.T means Medium Term Program.
3/ L.T means Long Term Program.

Source : JICA Study Team, 1987

Table G.1.9 Road Density in Western Samar

Program	(a) Total Road Length (Km)	(b) Total Land Area (Km2)	(c) Arable Land Area (Km2)	(d) Population (1,000 persons)	Road Density (a)/(b)	(a)/(c)	(a)/(d)
1987	920	5,609	1,871	565	0.16	0.49	1.63
S.T	1,040	-do-	-do-	603	0.19	0.56	1.72
M.T	1,260	-do-	-do-	645	0.22	0.67	1.95
L.T	1,730	-do-	-do-	716	0.31	0.92	2.42

Source : JICA Study Team, 1987

3) Estimated traffic volume

a) Data base and methodology

i) Estimate of future motor vehicles registered

The ratio of motor vehicles registered per 1,000 population in long term development is estimated by trend method. And then, the future number of motor vehicles registered is calculated by the future ratio of motor vehicles registered and future population in long term development.

ii) Estimate of future traffic volume

The future general traffic volume is estimated by the present traffic volume based on the traffic survey by DPWH and JICA Study Team and the growth rate of the motor vehicles registered.

It is expected that the future agricultural production will increase about 2.5 times of the present production due to the proposed agriculture development. Then, the future traffic volume is taken into account the agriculture related traffic volume. The output of the agricultural production is converted into the traffic volume by the five-tonne truck.

b) Future traffic volume in long term development

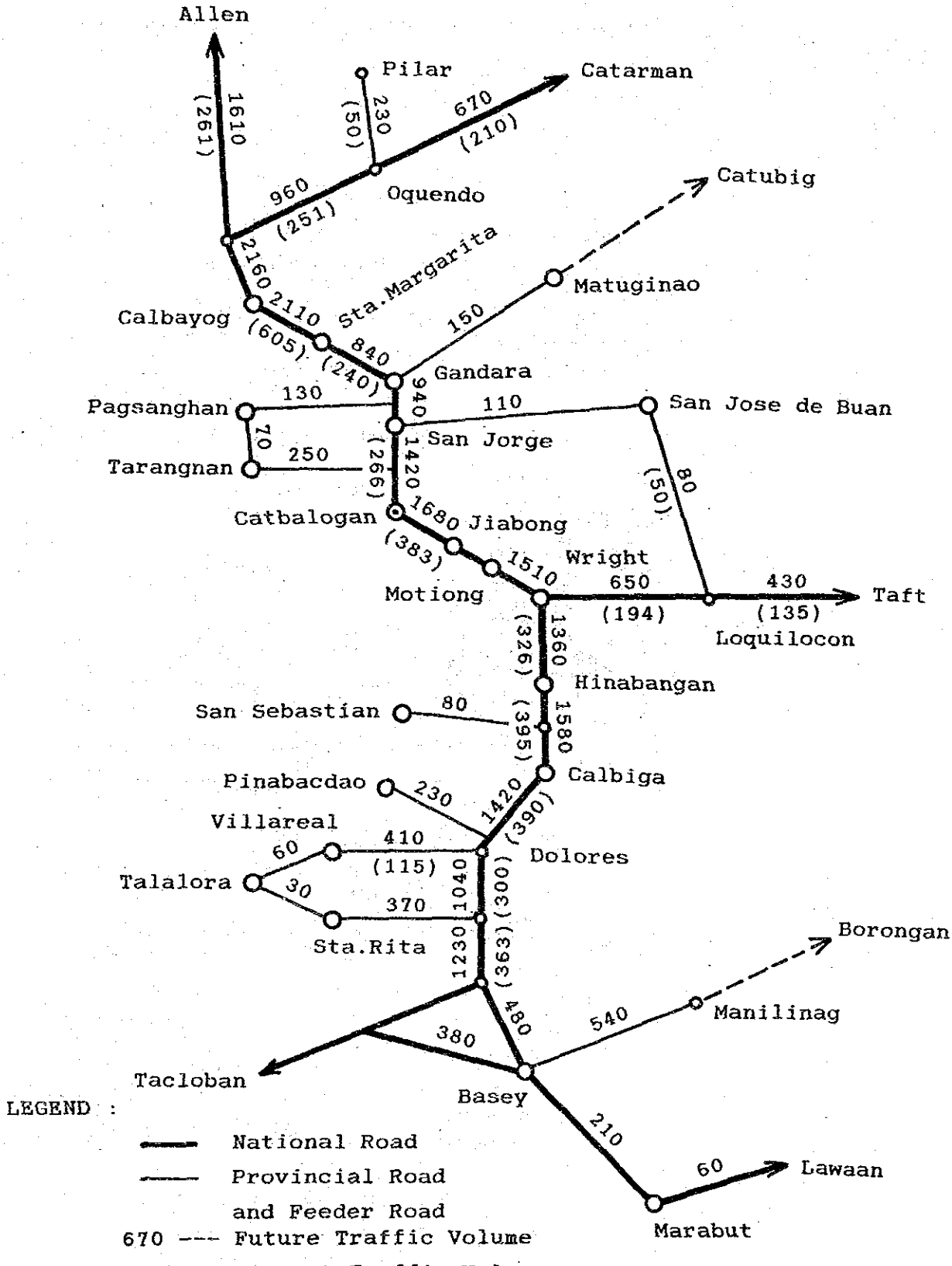
The future traffic volume is the general traffic volume plus the agriculture related traffic volume as described in Figure G.1.6.

4) Farm-to-market road

Farm-to-market roads, barangay roads and bridges are lacking in agricultural productive areas. Therefore, people in rural areas use a river and foot trails for transportation of commodities and agricultural products at present, and these problems affect agricultural productivity and life of farmers.

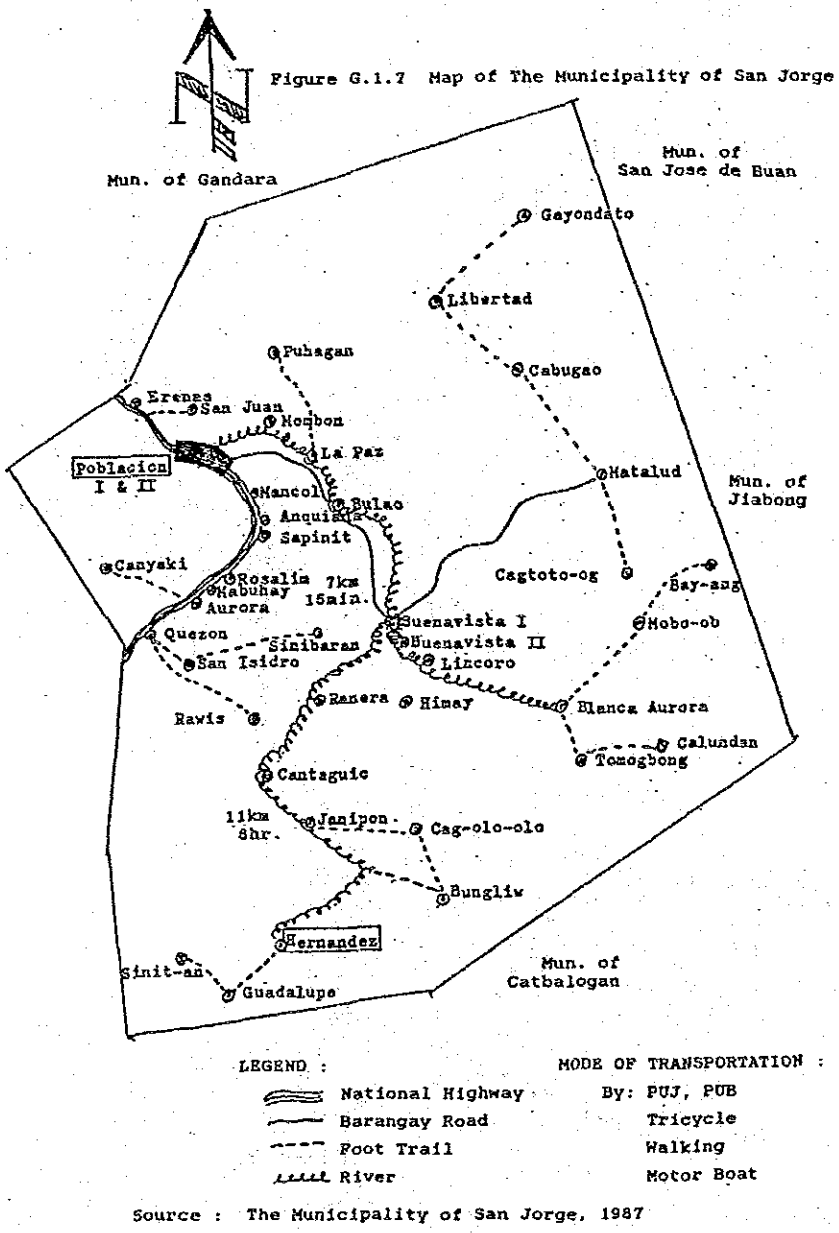
For example, it takes about eight hours and 15 minutes (8 hours by boat and 15 minutes by tricycle) from Hernandez until Poblacion and transport capacity is limited by mode of transportation such as

Figure G.1.6 Estimated Annual Average Daily Traffic in Long Term Development



boats and walking in the municipality of San Jorge as shown in Figure G.1.7. After a completion of farm-to-market roads, it will only take about 30 minutes for time of travel and traffic capacity will increase.

Figure G.1.7 Map of The Municipality of San Jorge



LEGEND :
- National Highway
- Barangay Road
- Foot Trail
- River

MODE OF TRANSPORTATION :
By: PUJ, PUB
Tricycle
Walking
Motor Boat

Source : The Municipality of San Jorge, 1987

G.2 Transportation

G.2.1 Road Transportation

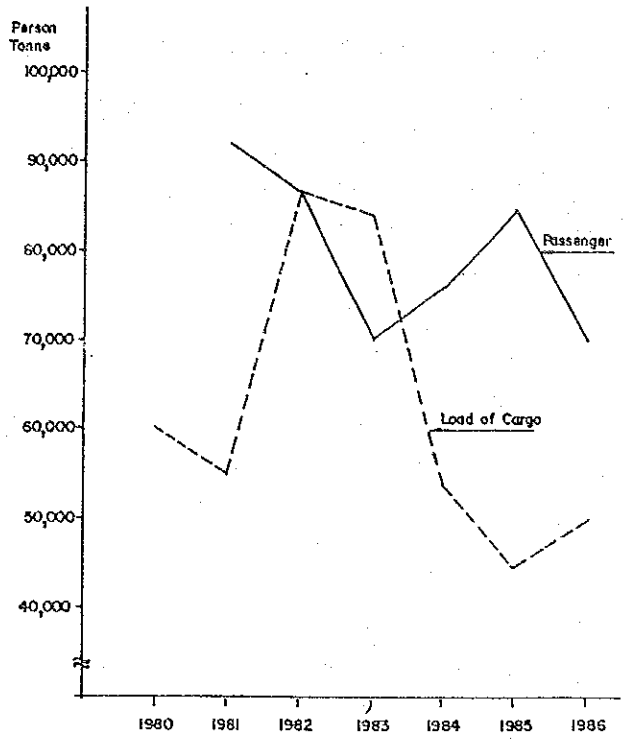
Table G.2.1 Existing Service Level for Road Transportation

Route	Number of Units	Frequency of Trip	Passenger Capacity (Person/ Vehicle)
BUSES			
Guiuan (Eastern Samar) to Manila via Catbalogan	7	2 per week	65
Calbayog to Tacloban and vice versa	5	1 round per day	45
Catbalogan to Tacloban and vice versa	11	2 round per day	45
Calbayog to Catarman (Northern Samar) and vice versa	1	1 round per day	45
Tacloban to Allen via Calbayog	3	1 per day	45
Tacloban to Catarman	2	1 per day	45
JEEPNEYS		(round per day)	
Calbayog to Catbalogan and vice versa	2	1	16
Calbayog to Gandara and vice versa	2	2	16
Calbayog to Mawo and vice versa	1	2	16
Calbayog to Victoria and vice versa	1	1	16
Calbayog to Allen and vice versa	20	1	16
Calbayog to Catarman and vice versa	5	1	16
Allen to Calbayog and vice versa	2	1	16
Catbalogan to Calbayog and vice versa	14	2	16
Catbalogan to Allen, via Calbayog and vice versa	2	1	16
Catbalogan to Calbiga and vice versa	15	2	16
Catbalogan to Gandara and vice versa	6	2	16
Catbalogan to Borongan and vice versa	6	1	16
Catbalogan to Hinabangan and v.v.	2	2	16
Catbalogan to Wright and vice versa	5	4	16
Catbalogan to Brgy. Lawa-an and v.v.	3	1	16
Calbiga to Tacloban and vice versa	7	2	16

Source: Land Transportation Commission, Calbayog and Catbalogan

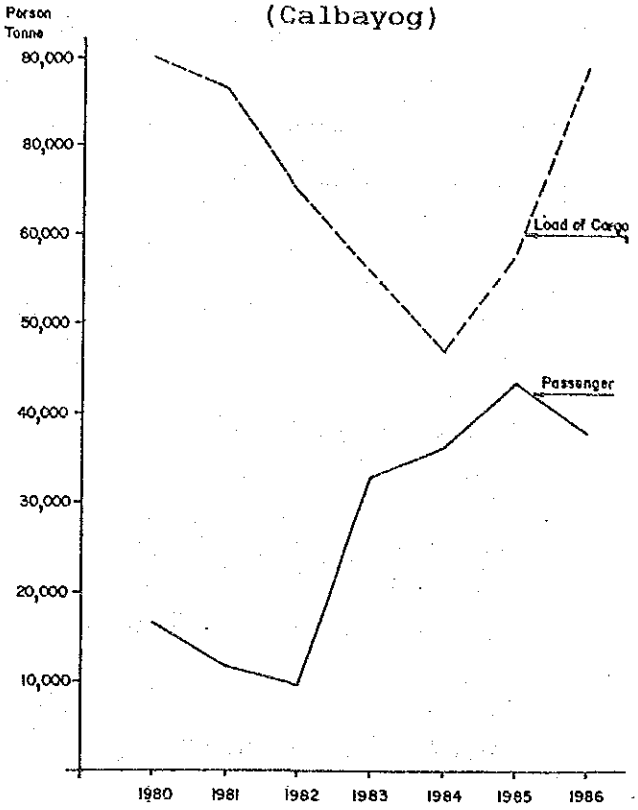
G.2.2 Sea Transportation

Figure G.2.1 Sea Transportation (Catbalogan)



Source: PPA Regional Office in Tacloban

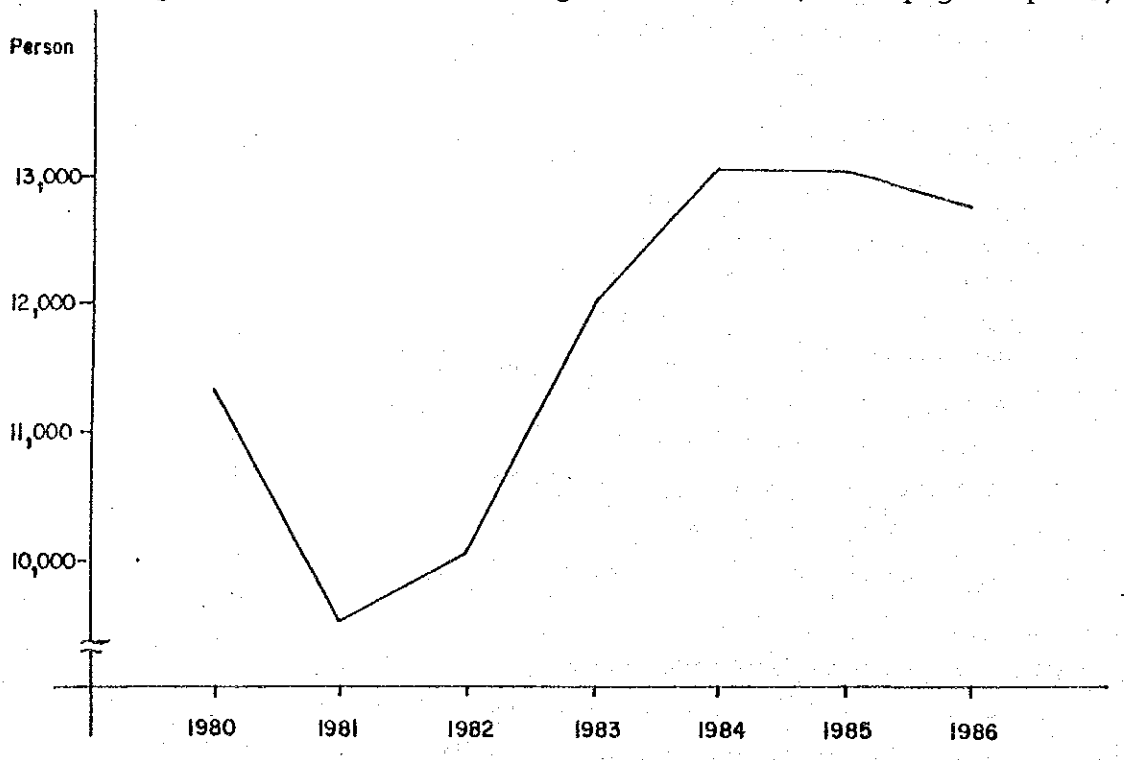
Figure G.2.2 Sea Transportation (Calbayog)



Source : PPA Regional Office in Tacloban

G.2.3 Air Transportation

Figure G.2.3 Air Passenger Movement (Calbayog Airport)



Source: Bureau of Air Transportation

APPENDIX H. RURAL ELECTRIFICATION AND MINI-HYDROPOWER

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H.1. Power Supply

H.1.1. Power Supply System

Firewood or fuel for light and cooking in human livings was indispensable since the old time. Those materials were available by providing self-support or small commercial transaction in the rural area. However, in the cities and the modernized industrial communities, electric power is supplied as powers with clean and convenience, which contributes to leveling-up of the people's welfare, complete of social infrastructure and high productivities.

The present of the Samar province is still being situated at the level of pre-industrialization and power supply is available in the quite limited area where located along the highway and trunk roads. People of the rural area are eagerly desired a favor of the power supply.

The Government of the Philippines has taken up promotion of energy self-sufficiency and national electrification in its targets of important administrative policy. NPC is responsible for development of the large scale power generation which is the base of the national energy policy and has been tried to meet the large demand through providing the power plants and necessary power grids throughout the Country, while NEA is responsible for the rural electrification and development of mini-hydropower generation and dendro-thermal plants by providing ELCOs throughout the Country to administer smoothly management and financing for the rural electrification.

The large users of NPC power supply are enterprises, urban municipalities, governmental organization, local ELCOs, etc. The power grids in the country can be roughly divided into three, the

Luzon Grid, Visayas Grid, and Mindanao Grid. The Visayas and the Mindanao Grids are further divided into five and two subgrids, respectively. Samar province is covered by the Leyte-Samar subgrid of the Visayas Grid.

Power supply for the Samar province at present is being provided by self-generating diesels which are 350 KW of SAMELCO I and 5,500 KW of SAMELCO II and also by a mini-hydropower generation at Ton-ok with capacity of 1,080 KW at maximum. The power in shortfall is supplemented by NPC via DORELCO, LEYELCO and SAMELCO II in transforming at SAMELCO II, who plays as mother station to supply to SAMELCO I, Eastern Samar and Northern Samar, respectively.

Power development has been carried out throughout the country with stress on geothermal power generation, and hydropower generation in view of the energy self-sufficiency. In the Leyte-Samar subgrid, a vital role is given to the geothermal power generation in Leyte, and the power available thereby will not be only supplied sufficiently to the relating territory but transmitted to the Luzon Grid.

To improve the present situation in the Samar province, power supply is planned from the Tongonan Geothermal Plant to Wright sub-station crossing San Juanico Strait by 138 KV transmission lines under construction now by Leyte-Samar Interconnected Transmission Line Project. Wright sub-station newly constructed has a capacity of 30 MVA.

The power rate by NPC supply varies from Grids. The rate to the Visayas Grids, although highest in the past, has become lower than that for the Luzon Grid since 1985 owing to geothermal power development, and to meet the national average rate, including the Mindanao Grid with much hydropower generation. And now, the power rate generally shows a declining tendency since 1985 as shown in Table H.1.1.

On the other hand, ELCOs consisting of the local members supply with their users the power generated by their own generation facilities together with power distributed by NPC through their own lines.

There are 118 ELCOs serving throughout the country after some unification and abolishment for 120 ELCOs in 1985. The Leyte-Samar subgrid has 11 ELCOs including four in Samar island. In the Samar province, the SAMELCO I and II were organized to enter into membership in 1974 and 1975, respectively and cover 23 municipalities and 773 barangays out of 931 in the whole territory, excluding three small islands. The power supply in the Samar

province has currently been practised by two SAMELCOs and the further rural electrification as well.

SAMELCO I was founded in 1974 in Calbayog City and expanded his coverage of two municipalities in 1986 covering a whole area of his administration excluding islands. At present, distribution of electricity by SAMELCO I reaches to cover eight municipalities, 92 barangays and 7,374 households.

SAMELCO II was funded in 1975 in Wright municipality and will cover a whole area of his territorial area when an expansion plan to two islands is realized as scheduled in 1987. At present, distribution of electricity by SAMELCO II covers over 11 municipalities, 104 barangays and 11,220 households. SAMELCO II is receiving power supply from NPC and supplies electricity not only for his territorial area but also to three other ELCOs in Samar island as mother cooperative.

Rural electrification in the Samar province is quite left behind in terms of electrification ratio. According to NEA, the ranking of electrification ratio among 118 ELCOs appeared at 111th and 114th in order for SAMELCO I and SAMELCO II, respectively. It shows that rual electrification in the area is also one of the most depressed subject. Rural electrification in the Samar province is biased in the area along the Maharlika highway and/or the closed area. Out of about 92 thousand households in the Samar province, only about 20% of the total enjoy with electricity and the rest are used with kerosene or others.

H.1.2. Present Power Supply and Demand

Electric distribution and rural electrification in the Samar province is handled by two ELCOs; SAMELCO I and SAMELCO II, and salient features of two ELCOs is shown in Table H.1.2.

In the relevant territory, there are such generation facilities provided as 5,850 KW of diesel generators (350 KW for Calbayog and 5,500 KW for Wright) and a mini-hydropower plant constructed in 1983 at Ton-ok with capacity of 1,080 KW at maximum. The power in shortfall is supplemented via San Juanico Bridge in transforming at SAMELCO II. And this SAMELCO II plays as mother station to supply power to SAMELCO I, Eastern Samar and Northern Samar. NPC source is from Tongonan Geothermal Plant with capacity of 112.5 MW.

NPC sells power to DORELCO at 0.85 Pesos per KWH in average which ranges about 0.72-0.89 Pesos per KWH and SAMELCO II receives via DORELCO and LEYELCO at 1.79 Pesos per KWH, however, SAMELCO II transmits power to SAMELCO I at 2.18 Pesos per KWH and to both Northern and Eastern Samar at 2.50 Pesos per KWH in adding some transmission charges. As a result, an electric rate in Northern Samar come up to more than 4.00 Pesos per KWH. In this regard, the Samar province is located a little advantageously among provinces in Samar island.

The rate for residences is 2.35 Pesos per KWH for SAMELCO II and 2.70 Pesos per KWH for SAMELCO I, while for commercial and industrial users, a slightly higher rate is applied with demand charge.

The present situation on purchasing/transmitting power with certain complicated procedures will be improved by direct power supply to SAMELCO II from NPC by providing a transmission line between NPC Tongonan Geothermal plant and new Wright substation under Leyte-Samar Interconnected Transmission Line Project. On-going project with financial assistance of OECF of Japan has constructed Wright substation with 30 MVA and a partial transmission line of crossing over the San Juanico Strait while the rest transmission lines of 78 km in Leyte and 49 km in Samar is expected to complete within 1988. When the said project is completed, SAMELCO I is expected to receive electricity with the rate at almost a half of the present.

Concerning the present situation of the power supply, there exist frequent brownout at the peak demand and extremely drop down the end voltage. On this matter, power supply for the industrial/commercial users is more serious than the house connection. When the time comes to supply the power for the industrial/commercial, improvement/upgrading of the power distribution system shall be required even in the rural area. Possible utilization of mini-hydropower generation in the rural area is seen on the supplemental power supply at almost the end of the distribution system in order to serve voltage drop down and easily supply the commercial/industrial power at the remote barangay.

H.2. Present Rural Electrification

Concerning rural electrification in the Samar province as of August 1987, about 30% of the whole barangays was energized, and about 21% of the total households was enjoyed with electricity (refer to Table H.2.1). The rural electrification ratio of about 30% for energized and 21% for house connection in the Samar province

Table H.1.1. National Power Corporation Average Rate

(unit: ₱/KWH))

Grid	1966	1977	1980	1983	1984	1985	1986
Philippines	0.0321	0.1330	0.3423	0.5790	0.8751	1.0985	0.9681
Luzon	0.0348	0.1583	0.3641	0.6152	0.9740	1.2091	1.0553
Visayas	0.0642	0.2941	0.4078	0.7244	0.9980	1.0401	0.9063
Panay	-	-	0.4310	0.7190	1.1660	1.0833	0.7766
Bohol	0.0628	0.2150	0.3400	0.6640	0.9540	1.0769	1.7621
Negros	0.0660	0.2340	0.3290	0.6550	0.8580	1.1071	1.0305
Cebu	-	0.3200	0.4520	0.6320	1.1010	1.0785	0.9467
Leyte - Samar	-	0.3090	0.2750	0.6130	0.7930	0.9531	0.8557
Mindanao	0.0201	0.0455	0.1611	0.2996	0.3740	0.5205	0.5086

Source: NPC

Note : In 1986 average rates dropped, as a result of fuel price decreases and discounts granted; 1986 NPC Annual Report.

Table H.1.2. Statistic Report of Electric Cooperatives

Description	Samar I Electric Cooperative Inc. (SAMELCO I)	Samar II Electric Cooperative Inc. (SAMELCO II)
Date of Coop. Registration	Feb. 27, 1974	Aug. 23, 1975
Date of First Energization	Nov. 1974	Dec. 1975
Cooperative Office	Carayman, Calbayog-City	Wright
Membership	8,023	12,210
Total Amount of Loan	26.9 Million Pesos	89.7 Million Pesos
Total Release	21.9 Million Pesos	79.5 Million Pesos
Coop. District Election	October	April
Annual Meeting	December	May
Status of Energization		
Number of Municipalities	10	13
Number of Barangays Covered	370	403
Energized	92	104
House Connection Potential	39,902	39,819
Actual	7,374	11,220
General Statistics for 1985		
Generated & Purchased	301,000 KWH/Month	859,000 KWH/Month
Sold	267,000 KWH/Month	529,000 KWH/Month
Gross Revenue	734,000 P/Month	1,257,000 P/month
Peak Load	1,250 KW	2,000 KW
Power Plant		
Self-Generating Diesel	350 KW	5,500 KW
Mini-Hydro	1,080 KW	-
Substation (5 MVA)	1 station	1 station
Distribution Line	3ϕ 118 Km	129 Km
13.2 / 77.6 KV	Vϕ 15 Km	29 Km
	1ϕ 25 Km	57 Km
200 - 220 V	Sec. 34 Km	55 Km
Transmission 69 KV	-	158.4 Km

Source: SAMELCO I and SAMELCO II

is quite slow pace in comparison to the nationwide electrification ratio of 58% for energized and 48% for house connection as of March 1987. In the Table H.2.1, "energized" means the area reached by transmission lines and "house connection" means the number of households electrified already.

As learned from the present situation of the energized barangays, the distribution lines are provided only along the trunk roads, although extension has been tried. That is because the effective maintenance services for the lines cannot be rendered without roads. The electrification ratio of the Samar province is found in proportion to the road density.

In a barangay not yet energized, petroleum lamps still occupy a considerably large share in lighting. Positive promotion of electrification is deemed essential from the viewpoint of lighting. In terms of amount of money, a monthly expenditure for petroleum of lighting seems to be a little bit higher than that of electricity. And also, rural livings without electricity will be considered one of constraints to join in cultural and economical activities.

Even in the energized barangays, however, only such houses and buildings are lighted as several ordinary households near electric poles, shops handling soft drinks with refrigerators, public buildings, and street lightings. The street lighting facilities are provided by the expense of respective ELCO and are decorated impressively by each ELCO as symbol of electrification. Delay in electrification for individual households would result from comparatively high power rate to the rural living standard.

Power consumption for residences of about 40% is the largest consumer followed by shops of about 20% and public facilities and street lights of about 10% each (refer to Table H.2.2). Contrarily, the consumption by industrial sector of about 10% is so small as to suggest the delay in the industrial development in this territory. The monthly consumption of electricity are estimated at 15 to 20 KWH for residence, 200 KWH for shop, 2,000 KWH for industrial use, and 20 KWH for a street light.

In the rural area, a usage of electricity for lighting and cooking was shared a little according to 1980 Census of Population and Housing, Samar, as shown in Table H.2.3. Electricity for lighting is about seven percent in the rural area and about 38% in the urban area. Inspite of a little share of electricity, kerosene is shared a big proportion.

Electric demand for future house connection of about 73,400 households in the Samar province will be almost same electricity presently supplied by SAMELCOs I and II taking into consideration average electric consumption at five hours a day with 100 watts. The house electric consumption can be estimated at 15 KWH a month per house and about 13.2 million KWH per annum which is nearly equal to the total annual generated and purchased electricity by SAMELCOs (of about 13.9 million KWH) in 1985.

Concerning the present capacity of the electric distribution, it can be estimated about 0.2 KVA per house and it seems to be sufficiently accommodated for the peak demand in the night time. The present capacity of the electric distribution lines in the rural area can be applied for future expansion in the rural in case that no particular electric appliances is introduced in the area. In addition to the above, countermeasures on the end voltage drop and separation of industrial distribution from the house distribution line shall be provided when the rural electrification is expanded.

Future demand of electricity in Samar province is estimated based on an assumption that after completion of Leyte-Samar Interconnected Transmission Line Project, 138 KV within 1988, all barangays will be energized and then annual increment of electric consumption will be by about five percent as shown in Table H.2.4. And also according to the above estimation, future demand will be requested another 138 KV line by 1990s.

H.3. Mini-Hydro Power Development

H.3.1. Present Power Generation

As mentioned in the previous paragraph, the Ton-ok hydropower plant is playing a vital important role to improve the power supply in the SAMELCO I territory. The Samar province is so pluvious that there are many sites available for hydropower generation although small in the scale. In future, the mini-hydropower generation will be given an important role for rural development, as the rural electrification is promoted from linear progress into networks.

Table H.2.1. Existing Electrification in Samar Province

	Number of Barangay			No. of Household			Existing	
	Brgy. (A)	Energized (B)	B/A (%)	Household (C)	H. Connection (D)	D/C (%)	T. Farmer (E) KVA	E/D KVA
Samar	931	274	29.4	91,999	19,595	21.3	8,345	0.43
SAMELCO I & II	792	274	34.6	78,789	19,595	24.9	8,345	0.43
SAMELCO I	369	95	25.7	34,987	6,867	19.6	3,555	0.52
Calbiga	161	57	35.4	19,590	5,007	25.6	2,740	0.55
St. Margarita	36	11	30.6	3,135	799	25.5	285	0.36
Gandara	64	12	18.8	4,565	455	10.0	265	0.58
San Jorge	42	7	16.7	1,743	203	11.6	105	0.52
Trangnan	15	6	40.0	2,837	197	6.8	80	0.42
Pagsanghan	14	2	14.3	1,187	206	17.4	80	0.39
San Jose de Buena	14	0	0	1,087	0	0	0	-
Natuguinao	23	0	0	843	0	0	0	-
SAMELCO II	423	179	42.3	43,802	12,728	29.1	4,790	0.38
Catbalogan	57	32	56.1	10,254	6,484	63.2	2,770	0.43
Jiabon	34	13	38.2	2,073	528	25.5	150	0.28
Motiong	30	5	16.7	1,951	181	9.3	55	0.30
Wright	48	20	43.5	4,023	951	23.6	315	0.33
Hinabangan	19	7	36.8	1,839	298	16.2	50	0.17
Calbiga	39	18	46.2	2,584	717	27.7	285	0.40
San Sebastian	14	10	71.4	833	314	37.7	100	0.32
Pinabacdao	25	13	52.0	1,860	513	27.6	210	0.41
Villareal	38	21	55.3	3,708	737	19.9	195	0.26
Sta. Rita	34	23	67.6	3,991	588	14.7	220	0.37
Basey	52	15	28.8	7,290	1,279	17.5	395	0.31
Talaora	11	2	18.2	1,136	138	12.1	45	0.33
Marabut	24	0	0	2,260	0	0	0	-

Source: SAMELCO I & II Arranged

Table H.2.2. Average Monthly Electric Use in Samar Province (1984-1986)

Description	SAMELCO I		SAMELCO II		Total			
	x 10^3 KWH	No. Con.	x 10^3 KWH	No. Con.	x 10^3 KWH	%	No. Cons.	KWH per Cons.
Residential	111.8	5,180	160.6	11,110	272.4	41.4	16,290	17
Commercial	45.4	386	80.5	358	125.9	19.1	744	169
Industrial	20.9	59.0	59.0	38	79.9	12.1	39	2,049
Public	20.1	128	40.1	161	60.2	9.1	289	208
Street Lights	51.7	1,231	19.6	926	71.3	10.8	1,944	37
Other (Coop. Consump.)	14.5	-	34.6	-	49.1	7.5	-	-
Total	264.4		394.4		658.8	100.0		

Source: SAMELCO I and SAMELCO II

Table H.2.3.

Electric Use on Household Lighting and Cooking

Lighting

	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Electricity	4,734	37.6	5,601	7.0	10,335	11.2
Kerosene	7,583	60.3	67,591	85.2	75,174	81.8
LPG	163	1.3	5,647	7.1	5,810	6.3
Oil	11	0.1	393	0.5	404	0.5
Other	89	0.7	127	0.2	216	0.2
Total	12,580	100	79,359	100	91,939	100

Cooking

	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Electricity	123	1.0	335	0.4	458	0.5
Kerosene	1,310	10.4	4,617	5.8	5,927	6.5
LPG	1,275	10.1	852	1.1	2,127	2.3
Wood/Charcoal	9,836	78,2	73,210	92.3	83,046	90.3
Other	36	0.3	345	0.4	381	0.4
Total	12,580	100	79,359	100	91,939	100

Source: 1980 Census of Population & Housing, Samar

Table H.2.4. Load Forecast in Samar Province

	SAMELCO I (MWH)	SAMELCO II (MWH)	Total (MWH)	Remarks
1975	777	2,350	3,127	Coop. in Service
1980	(780 KW)	(1,130 KW)	(1,910 KW)	
	2,450	4,500	6,950	
1985	(1,250 KW)	(2,000 KW)	(3,250 KW)	Tanok HPS in Ope.
	3,600	6,500	10,100	
1987	(2,050 KW)	(3,500 KW)	(5,550 KW)	Existing
	5,150	9,300	14,450	
1988	5,320	9,600	14,920	138 KW Transmission Line will be completed.
1989	13,000	23,500	36,500	
1990	(4,000 KW)	(7,000 KW)	(11,000 KW)	
	17,200	31,100	47,300	
1995	10,300	33,000	51,300	All Barangay will be energized
2000	(7,000 KW)	(10,000 KW)	(17,000 KW)	
	19,400	35,000	54,400	
2050	20,500	37,000	57,500	

Source: SAMELCO I and SAMELCO II

Table H.2.5.

Distribution System Extension Plan in Samar Province

	Object			Quantity			
	Barangay (A)	Energized (B)	(A)-(B)	Unit Distance	Total Dx (km)	Secondary Line 1 (km)	Secondary Line 2 (km)
Samar (SAMELCO I & II)	792	274	518		976	265	253
SAMELCO I	369	95	274		501	139	135
Calbayog	161	57	104	1.5	156	52	52
Sta. Margarita	36	11	25	1.5	37.5	13	12
Gandara	64	12	52	2.0	104	26	26
San Jorge	42	7	35	2.0	70	18	17
Trangnan	15	6	9	3.0	27	5	4
Pagasanghan	14	2	12	2.0	24	6	6
San Jorge Buena	14	0	14	3.0	42	7	7
Mataguinao	23	0	23	2.5	57.5	12	11
SAMELCO II	423	179	244		475	126	118
Catbalogan	57	32	25	1.8	45	13	12
Jiabon	34	13	21	2.0	42	11	10
Motiong	30	5	25	2.0	50	13	12
Wright	46	20	26	1.5	39	13	13
Hinabangana	19	7	12	4.0	48	6	6
Calbiga	39	18	21	2.5	53	11	10
San Sebastian	14	10	4	2.0	8	2	2
Villareal	38	21	17	2.0	34	9	8
St. Rita	34	23	11	2.0	22	6	5
Basey	52	15	37	2.0	74	19	18
Talalora	11	2	9	2.0	18	5	14
Marabut	24	0	24	1.0	24	12	12

Source: SAMELCO I and SAMELCO II

Development program of the house connection

Short term development	50%
Medium term development	80%
Long term development	100%

The power distributed through the Leyte-Samar subgrid is generated at the Leyte geothermal power plant and both the rate and amount have been improved. For the time being, the power doubled with the present consumption can be supplied through a new Leyte-Samar Inter-transmission line with 138 KV and the new substation constructed at Wright by the year 1988. Such power available shall be utilized in the Samar province as receiving site, and at first, it is quite essential for the power to be used therein for economic vitalization of the energized areas. And once electrification started, the demand of power would be increased rapidly. In the case, mini-hydropower development will be most effective, particularly in the remote rural areas to eliminate shortfall in power supply at the distribution terminals and to reinforce the whole grid of the territory.

The mini-hydropower plants in more than 500 KW now under contemplation by NEA for the Samar province are a plant with 1,800 KW on the Bugtong river (Head: 195 M and Discharge: 0.446 m^3/s), and 3,300 KW on the Ulot River. The former has been surveyed and designed already, while the latter is still a proposed site with potential and not surveyed yet.

As for the proposed site, the Ulot is one of the left tributaries joining at Tula near the Eastern Samar and about 40 m damming up will enable to storage a sufficient volume drained from the catchment area, and it is expected to generate about 4,000 KW of power there.

The Bugtong plant will be effective to reinforce the distribution system in northwestern Samar area, while the Ulot plant will be effective to reinforce the whole Samar Grid by being connected with the transmission system from Wright to Taft. The both sites are selected in view of their most favorable potential of hydropower, being followed by more than ten sites with better conditions.

Besides the above, many mini-hydropower generation sites can be found near the consumers at a fall with catchment area of more or less five km^2. Mini-hydropower plant in low hydro-potential and other conditions for power generation like small water head so far is slightly high cost. In other point of socio-economic development, the mini-hydropower development plan for local industrial energy supply shall be prudently made in taking into account the combination of other kinds of energy as dendro-thermal energy, biomass energy, solar energy, wind energy, etc.

More direct effects can be considered available in the comprehensive development projects. For the Samar province, the mini-hydropower development aims to supplement the existing regional electrification and to give direct effect on the comprehensive rural area development. In any case, it is deemed indispensable that clean and locally available energy resources should be utilized as effectively as possible for socio-economic vitalization of the area.

H.3.2. Potential Hydropower Generation

The hydropower development in the Samar province has been just started, although there is considerably high development potential expected judging from rainfall, topography, etc. There are many places with promising potential of hydropower other than the ready-developed Ton-ok, designed Bugtong and the Ulot site taken up in the Master Plan. These potential sites are plotted on the topographical maps with marks by falls or rapids.

More than ten sites are found on the maps, providing the conditions of economy, catchment areas more than ten Km^2 and water head more than 20 m. Topographically, there are many sites favorable with large water head along the upper/middle stream of the Gandara and Ulot flowing out from the northwestern mountain mass and the central mass with Huray in the northeast, and those rivers originate in the east of Basey. Some of these sites are selected for studying on the respective catchment areas, feasibility of generation plant construction, etc., on the map although field investigation was carried out up to the accessible points.

The summary of the above estimation is shown in Table H.3.1. In the Samar province, there are many Karst plateaus spreading sporadically, and in the Karst areas, surface runoff is found a little in amount, although infiltration and underground flow can be found much. And the surface flow as runoff is hand to be observed. Consequently, further study shall be carried out to clarify the details to meet the final design requirements in taking the aforesaid condition in the Area.

1) Selection of hydropower potential site

The hydropower Development commonly begin with findings of hydropower potential sites on topographical maps. Field investigations and topographic survey are carried out after screening of potentialities to study the selected sites on their technical and economical feasibility in getting the study into more and more details.

Among various factors, water head will be roughly determined on the topographic conditions, in case of conduit type power generation. By introducing the regulating method, damming up across the river will ensure to increase the water head to the some extent. Hydropower development by damming up are planned in the Blanca river and the tributaries of Ulot river.

2) Type of hydropower generation

The type of hydropower generation is classified according to the type of structure into three types, conduit type, dam type and conduit and dam type. The type to be employed is determined mainly by the physical conditions.

a) Conduit type hydropower generation

The conduit type is suitable for the site located at the upper or middle reaches of a river with steep gradient. Usually, the site is selected with 1/200 gradient or steeper. The structures of this type consist of a diversion dam and leading canals with gentle slope.

The conduit type is further classified according to the operating method as follows:

- Run-of-River Type (Natural Stream Flow Type)
- Run-of-River with Regulating Reservoir Type

b) Dam type hydropower generation

The dam type requires a relatively high dam construction in a river to store water and to obtain a head and has a power plant located immediately downstream or in the vicinity of the dam. The dam type is further classified according to the operational capacity as follows:

- Pondage Type ... This type has a pond with a capacity capable of regulating the discharge for about one day or one week for the effective storage.

- Reservoir Type ... This type has a reservoir capable of annual or seasonal regulation with a dam having a large effective storage.

c) Dam and conduit type hydropower generation

The dam and conduit type is a combination of the dam type and conduit type and is usually constructed in the middle reaches of a river. The head for the hydropower generation is created with the storage by the dam and also by the conduit (pressure tunnel).

The operational classifications of the dam and conduit type are the same as those for the dam type mentioned above. The net head is also similarly obtainable to that in the case of the conduit type.

Small-scale hydropower generation among the various hydropower generation types is inferior in economy to large-scale hydropower generation, and it is usual to independently plan a dam exclusively used for hydropower generation. Most of the intake facilities newly built are equivalent in scale to diversion dam used in the conduit type hydropower generation. The dam type and the dam and conduit type hydropower generation are generally developed as new joint works with are agricultural dam development or as a development for the effective use of the existing dams.

3) Estimation of necessary water for power generation

Commonly, the necessary water amount for power generation is estimated so as to keep the provided power facilities to be operated fully throughout the year. In this estimation, the constant or minimum water source employs the droughty discharge; available in 355 days throughout year. Although the discharge under the amount takes place, the number of generators and scale of facilities shall be determined based on the amount so that the power generation can be made efficiently up to this level of discharge at least.

The maximum discharge will determine the dimension of the facility's capacity and will affect the construction cost, facilities efficiency, and furthermore, the feasibility of the project. It is necessary to maintain stable power supply all the year round, and when the water is abundant, the lower discharge available in 275 days throughout year is employed. In the case of the wet discharge, 90-days discharge or even 60-days discharge should be taken even though a part of the facilities are in idling. In power-history, the former case should be employed for using hydropower as main source, while the latter case is considered for mini-hydropower generation in the complement of thermal power as main source with fossil fuel or nuclear power.

It is considered that the power generation in the Samar province tends to put stress on the conduit type and KWH in taking into account its scale and general conditions of the grid. The Ton-ok plant has a capacity of 1,080 KW, however, according to the record in 1985, maximum generated power was at 1,110 KW while it was only 67 KW at minimum. The difference between the above two is found as much as 16.5 times in operation. This fact clearly shows that the plant was planned on the KWH generating basis, and judging from the runoff pattern, 60-days discharge or more was adopted for the Ton-ok plant.

Generally, the discharge-to-generation ratio which is percentage of discharge used for generation against total discharge, is used for showing the actual operation status of a generation plant. For example, on the mini-hydropower plant in Japan, this ratio is ranging between 45 and 60% in corresponding to discharge condition.

In this case, however, the mini-hydropower plants, having a comparatively small catchment area, often have some constraint in designing the feeder canals with minimum cross-section for intake water. Consequently, as far as the water is taken at maximum by the said section, the plant is utilized most advantageously in considering the fact that the canal works occupies a large share in a total construction cost. And it is the most effective that the plant efficiency is around 40% or is in operation under 40 to 60 days discharge.

In this preliminary study, possibly simple way of calculation is employed in most prudent side so far as keeping the estimation principle, since the study is still in the stage to require further survey for more detailed data and information.

The discharge as the basic data is determined based on the annual average discharge curve of the Tenane River (Type II). The discharge curve is most gentle among those seven observations in Samar Island, found in the prudent side. In addition, another curve (Type I) is taken from the data of the Ton-ok as the one a little over the discharge at wet season to apply to a catchment area with much more runoff discharge. The judgment shall be made by plotting the catchment area on the runoff zone map.

Discharge Type	Discharge (m^3/sec/100 km^2)				
	60-days	95-days	185-days	275-days	355-days
I	9	6	3	2	1.5
II	7	5	3	2	1.5

4) Estimation of water head

The site selection shall be made on the general understanding of the topography, geology, hydrology and additionally on the basic idea on expected construction roads, generation type, relation of existing transmission/distribution lines, and operation method.

Since the 20 m interval contour lines are available on topographical maps with scale at 1/50,000, cross points of contours with the river course shall be found the points with 20 m water head within the 500 m along the river course. The symbols of falls and rapids on the maps suggest locations of such points with considerably large head.

If a considerable catchment area is found upstream of the water head point, this point can be considered as the potential water head point. The catchment area is estimated on the map with boundary of the basin. Judging from the shape of the contours, both the intake and release points shall be determined together with estimation of the elevation between the two points.

5) Power output and volume

Theoretical hydropower (KW) can be calculated by the following equation;

$$KW = 9.8 \times Q \times H$$

where; KW: Theoretical hydropower in KW
Q : Discharge in m^3/sec
H : Water heads in m

The Power output shall be obtained by reducing the losses caused by turbine, generators, etc. from the aforesaid hydropower. Different in kinds and types of equipment and devices, synthetic efficiency would be taken herein by 80% for turbines, 95% for generators, and 95% for others.

Therefore, the maximum and firm power output (Po) is calculated by the following equation;

$$Po = 9.8 \times (\text{synthetic efficiency}) \times Q \times H$$
$$= 7 \times Q \times H$$

The annual potential generated energy is calculated as follows;

Annual potential generated energy (KWH)
= Power output (KW) x Generation Time (Hrs)

Taking herein the discharge/facilities efficiency by 50%, and runoff by 4 m^3/sec/100 km^2 from the flow duration curve, the annual potential generated energy (KWH) is calculated by the following equation;

$$KWH = 7 \times H \times 4 \times CA \times T$$

Where; CA: Catchment area in km^2
T: Annual operation time in hrs
H: Water heads in m

This is the annual value in the assumption of full operation throughout the year and called the annual potential generated energy. The net annual generated energy is obtained by reducing losses resulting from idling by regular inspection, repair and emergency from the aforesaid potential energy. In the ordinary inflow type, idling period will be about ten days per year which can be considered as about five percent in decreasing the efficiency.

6) Selection of turbine generator

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

As learned from the results of the Ton-ok plant, such power generation energy has large difference in output between the maximum and minimum. Consequently, it is necessary that the equipment and devices should desirably arranged with the same kind and type by considering economy and easy operation and maintenance to meet the variable requirements by staggering operation with several number of turbines. The selection of generators shall be made in taking into account the conditions of the grid to be connected and demand to be expected.

In considering a cost factor and a turbine type together with the above conditions, the generators of induction and synchronized types shall be selected, and this selection will connect to the scale of the project cost and kinds of turbines. Furthermore, it may be taken into account to provide accelerators for low head sites. The turbine and generators shall be selected preliminarily in view of the aforesaid terms and conditions.

H.3.3. Theoretical Potential Hydropower Generation

Theoretical potentiality of the hydropower generation is studied based on average annual rainfall by area and elevation and available head up to the power plant. The Study area of 5,132 km^2 is divided into four sub-areas in terms of annual runoff as follows:

Elevation above Mean Sea Level (m)	Average Annual Runoff (mm)
0 - 200	1,500
200 - 500	2,000
500 - 700	2,500
700 - above	3,500

By appling an equation of the theoretical hydropower generation as explained in 4) of H.3.2, the total theoretical hydropower generation can be calculated at 800,900 KW or 156 KW per a km^2 of the Study area.

Taking into consideration the efficiency of hydropower generation, losses of run-off and other factors, the practical potentiality of the hydropower generation will be at about 400,000 KW or about 70 KW per a km^2 of the Study area. The existing hydropower generation is only 1,080 KW or only 0.3% of the potentiality. From this fact, it can be said that there are a lot of hydropower potentiality to be developed in Samar province.

H.3.4. Development Plan

Demand in electricity for rural electrification in the Samar province will be sufficiently supplied by the existing system for the time being. Mini-hydropower generation with a capacity of more than 500 KW will be developed to be beneficial for supporting the existing power system and to be stable distribution of electricity.

Construction of Bugtong hydropower plant will be started by the financial assistance of the United Kingdam to install the ready procured equipment after completion of construction of the access road. Mini-hydropower plants at Blanca and Ulot will be placed at the top of the priority for early development and further survey and study will be required for the provision of the definite plan.

In generally, the mini-hydropower plants will be developed for supplying the power for rural electrification and agri-industries to be developed in the remote barangays where no electric distribution line is available. Thus definite plan of the mini-hydropower plant will be studies further taking into consideration demand of the power in the rural area in the future.

Taking into consideration the potentiality of the power generation and availability of fund for development, Bugtong is planned as the short term development. Blanca and Ulot sites are proposed in the medium term development while the other potential sites are included into the long term development (refer to Table H.3.1).

H.4. Rural Electrification Plan

Rural electrification is being promoted by ELCOs under the supervision of NEA as reported in Appendix H.1. Each ELCO has a plan for rural electrification for a couple of years, however, she has no plan covering electrification of all barangays so far.

According to an electrification plan of SAMELCO I in 1988, distribution lines such as 13.5 km of Vϕ good for 32 house connection, 17.9 km of 1ϕ, 18 km of secondary distribution lines and total 49.4 km will be expanded to cover 3,231 house connections with cost of 2.43 thousand Pesos per house connection.

With regard to an electrification plan of SAMELCO II for recent two years period, 34 distribution lines such as 6.1 km of Vϕ 40.8 km of 1ϕ, 15.7 km of secondary distribution line and total 62.6 km will be expanded to cover 3,715 house connections with cost of 1.7 million Pesos which is equivalent to a cost of about 4.6 thousand Pesos per house connection. Transmission line from Wright to Matuguinao where is territory of SAMELCO I is included in the said plan. On the other hand, a transmission line between Basey and Marabut and also a transmission line to be connected between new Wright substation with 138 KV and the existing 59 KV transmission line, both will be constructed and the cost is estimated at 2,256 million Pesos.

According to funding capacity of ELCOs and available loan of NEA, rural electrification in the whole Samar province will be taken for more than ten years period notwithstanding that no consideration is made on social and economic development of the relevant area. In addition to the above, electrification of the remote barangays having no road system between the neighbouring barangays will be taken sometime and justfied on the program taking into consideration other social and economic conditions.

For promotion and enlightenment of barangay people on the rural electrification, BAPA has been organized on barangay basis and actives for the purpose. Rural electrification can be progressed by keeping close cooperation with BAPAs members, especially for the maintenance of the distribution lines. In other words, promotion of the rural electrification can be made in parallel with development of other social infrastructure, development of public services, accumulation of social and economic forces, etc.

Electric distribution system shall be developed to energize all barangays and to cover all households as house connection by the target year of the Integrated Agricultural/Rural Development Project according to the on-going plan of the electrification in which municipalities of Matuguinao, San Jose de Buan, Marabut and municipalities of islands will be energized by the year 1989 by SAMELCOs. The electrification will gradually cover about 500 barangays on the basis of 3 ϕ distribution lines of about two km on an average and secondary distribution lines of about 0.5 km on an average. By this stage, about 50% of the total potential house connection will receive electricity and then, the rest will be connected with distribution lines adding the additional secondary distribution lines of about 0.5 km on an average for each barangay.

Consumption of electric power in 1985 was about 10,100 MWH and its potential will be expanded up to about 55,000 MWH by the year 2000. It is seriously considered that electricity for rural electrification of about 13,200 MWH, usage of electric appliances, industrial uses, etc. will be drastically increased. Electric consumption per household also is estimated rather large at 52 KWH per month.

Table H.3.1. List of Hydropower Generating Potential Sites

No.	Potential Site	River	Catchment Area			Discharge		Head		Output		Annual Generated Energy	Development Program Based on Priority
			Area	Runoff Zone	Runoff Type	Max.	Firm	Water Level	Head	Max.	Firm		
			(Km^2)			(m^3/s)	(m^3/s)	(From-to)	(m)	(KW)	(KW)	(MWH)	
1	Bugtong	Bugton	13.5	B-C	I	1.22	0.20	200-50	150	1,800	210	4,820	Short Term
2	Tabukuno	Jamonini	5	B	II	0.35	0.08	45-20	25	60	14	298	Long Term
3	Malauog	Jiabong	12	A	II	0.84	0.18	30-10	20	120	28	572	-do-
4	Maruguinao	Gandara	6	B	II	0.42	0.09	210-90	120	350	76	1,714	-do-
5	Malapgap	Gandara Blanka	4.6	B	II	0.32	0.07	170-90	80	180	40	876	-do-
6	Maratud		4.3	B	II	0.30	0.06	70-20	50*	110	21	512	-do-
7	Blanka		200	B-C	II	14.00	3.00	40-15	25*	2,500	525	10,710	Medium Term
8	Aurora F.		20	B	II	1.40	0.30		3	30	6	143	Long Term
9	Tongbong		16	B	II	1.12	0.24	70-40	30	250	50	1,145	-do-
10	Heruando		13	B	II	0.91	0.20	140-80	60	400	84	1,856	-do-
11	Tagaoyang R.	Ulot	21	B	II	1.47	0.32	95-80	15*	160	34	780	-do-
12	Ulot R.		150	B-C	II	13.50	2.25	80-40	40	3,800	630	14,280	Medium Term
13	Calbiga	Calbiga	56	C	I	3.92	0.84	150-100	50	1,400	294	6,664	Long Term
14	Sohoton R.	Basey	50	B	II	3.50	0.75	210-100	110	2,700	578	13,090	-do-
15	Burgas		7	B	II	0.49	0.11	200-80	120	400	92	1,999	-do-
16	Ford	Legaspi	21	B	II	1.47	0.32	90-55	35	360	78	1,749	-do-

Note: *: Dam up
Prepared by JICA Study Team

Table H.4.1. Schedule of Distributions Development in Samar Province

	No of Barangay			Quantity		
	Total (A)	Energized (B)	(A)-(B)	Distance between Barangays (km)	Total Distance (km)	Secondary Line (km)
W. Samar (SAMELCO I & II)	792	274	518		1,000	550
SAMELOC I	369	95	274		500	300
Calbayog	161	57	104	1.5	156	110
St. Margarita	36	11	25	1.5	37	30
Gandara	64	12	52	2.0	104	55
San Jorge	42	7	35	2.0	70	35
Trangnan	15	6	9	3.0	27	10
Pagsanghan	14	2	12	1.5	18	15
San Jose Buena	14	0	14	3.0	42	15
Mataguinao	23	0	23	2.0	46	30
SAMELCO II	423	179	244		500	250
Catbalogan	57	32	25	1.8	45	25
Jiabon	34	13	21	2.0	42	20
Motiong	30	5	25	3.0	75	25
Wright	46	20	26	1.5	39	25
Hinabangan	19	7	12	4.0	48	15
Calbiga	39	18	21	2.5	53	20
San Sebastian	14	10	4	2.0	8	5
Pinabacdao	25	13	12	1.5	18	10
Villareal	38	21	17	2.0	34	20
Sta. Rita	34	23	11	2.0	22	10
Basy	52	15	37	2.0	74	35
Talalora	11	2	9	2.0	18	10
Marabut	24	0	24	1.0	24	25

Note: 50% for short-term, 80% for medium-term and 100% for long-term.

APPENDIX J. RURAL WATER SUPPLY

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J.1. Present Situation

J.1.1. Classification of the Water Supply System

- Level I Service

  This water supply service is very basic, consisting as it does of no more than the point source, which may be a well or a spring from which the service users must fetch their water supply. Its service coverage is on the average from 40 to 100 households.

- Level II Service

  This second level of water supply service is sophisticated compared with the first. It is a communal faucet system and has these features: A water source, a pipe distribution network, and a faucet for every four to six household.

- Level III Service

  This is the most advanced level of water service. It is an individual house connection system in which the supply of water coming from the source is delivered through a pipe distribution network directly to the house, where it can be drawn from a faucet.

J.1.2. Administration of the Waterworks

- LWUA (Local Water Utilities Administration)

  Its present delineated areas are cities and municipalities with a population of at least 20,000, which fall outside the administrative jurisdiction of the MWSS (Metropolitan Waterworks and Sewerage Authority).

- RWDC (Rural Waterworks Development Corporation)

  Its present administrative jurisdiction includes all areas not covered by the LWUA and MWSS.

- DLG (Department of Local Governments)

  The administrative functions it exercises in connection with waterworks are the following:

i) To oversee the phase-out of the Barangay Water Program (BWP) upon its completion in 1986.

ii) To assist in the organization aspect of the rural water supply program.

iii) To provide assistance in institutional development, a process of strengthening local government units, in this case, the formation of local RWSAs (Rural Waterworks and Sanitation Associations) and the training of its members.

- DPWH (Department of Public Works and Highways)

  It is responsible for the development of water sources for large communities and other settlements that are beyond the capacity of the RWSAs (Rural Waterworks and Sanitation Associations) or Water Districts (WDs), in accordance with the overall rural water supply plan.

The water supply implementation arrangement chart as shown in Figure J.1.1.

J.1.3. Water Supply Service Rate

Water supply service rates are as shown in

- Table J.1.1. Present and Planned Water Supply Coverage
- Table J.1.2. Service Coverage of Public Rural Water Supply in Present of Rural Population
- Table J.1.3. Population Served by Municipality 1984 and 1987
- Figure J.1.2. Population serve in Philippines
- Figure J.1.3. Service Level in Rural Areas
- Figure J.1.4. Population Served by Municipality 1984 and 1987

J.1.4. Water Resources

Water requirement forecast and water supply demand is as shown in Table J.1.4 and Figure J.1.5.

J.1.5. Water Quality Analysis

Water quality analysis of spring and river in the project area were analyzed in Japan, these are as shown in Table J.1.6. Kinabut-an and Mapaso spring is good enough as drinking water after chlorination. Sapinit river had been polluted from the environmental situation, however Gandara river is not pollution.

J.1.6. On-going Projects

On-going major rural water supply project is as shown in Table J.1.5.

Table J.1.1. Present and Planned Water Supply Coverage

	End of 1986		End of 1992	
	Percent of total	Population (In million)	Percent of total	Population (In million)
Metro Manila	92	7.33	98	9.13
Other urban area	73	10.77	74	14.04
Rural areas	53	17.66	77	29.86
Total	64	35.76	79	51.03

Source of basic data: NWRC, MPWH, MWSS, LWUA, RWDC, MLG

Source: Medium-Term Philippine Development Plan 1987 - 1992

Table J.1.2. Service Coverage of Public Rural Water Supply in Percent of Rural Population.

	Actual 1980	1985	1990	2000
Level I	36	44	47	52
Level II	0	16	28	33
Unserved	64	40	25	15

Source: Rural Water Supply and Sanitation Master Plan 1982.

Table J.1.3. Population Served by Municipality 1984 and 1987

		Population	Type of Water Supply			Served Population				
						Existing Facilities 1984		Effective Facilities 1987		Low-Served Ranking 1987
	Municipality	(1984)	Level I	Level II	Level III	No.s	%	No.s	%	No.
1.	Almagro (#)	11,026	19		1	6,031	55	-	-	-
2.	Basey	40,339	64	1		21,049	52	2,100	5	1
3.	Calbayog City	110,678	69		1	74,154	67	36,500	33	19
4.	Calbiga	13,456	36		1	11,102	82	2,100	16	6
5.	Catbalogan	63,468	100		1	42,493	67	20,900	33	20
6.	Daram (#)	36,024	94	1		32,197	89	-	-	-
7.	Gandara	26,292	46		1	14,044	53	2,600	10	3
8.	San Jorge	9,386	33			8,494	94	1,700	18	7
9.	Hinabangan	11,332	5		1	3,560	31	700	6	2
10.	Jiabong	12,599	24			7,759	62	2,300	18	8
11.	Marabut	14,010	23			6,518	46	1,600	13	5
12.	Matuguinso	5,438	3			929	17	700	12	4
13.	Motiong	10,735	29		1	7,611	70	2,600	21	11
14.	Pinabacdao	6,808	33			7,925	75	2,000	30	12
15.	San Jose de Buan	5,339	2		1	2,057	38	1,000	19	9
16.	San Sebastion	4,852	18			4,902	100	1,000	20	10
17.	Santa Margarita	18,947	49		1	13,512	71	6,600	35	21
18.	Santa Rita	22,896	75			19,757	86	5,700	25	13
19.	Santo Niño (#)	11,711	12			3,796	32	-	-	-
20.	Talalora	6,693	21			5,757	86	1,700	25	14
21.	Tarangnan	17,171	58			15,711	91	4,600	27	15
22.	Villareal	21,897	55			14,877	68	5,900	27	16
23.	Wright	22,660	58		1	17,653	78	7,000	31	18
24.	Zumarraga (#)	12,860	48			12,707	99	-	-	-
25.	Tagapul-an (#)	8,970	10		1	3,103	34	-	-	-
26.	Pagsanghan	6,848	17			4,704	69	1,400	21	12
	Total	536,133	932	2	11	362,502	67	-	-	-
	I.M. only	(#)80,591	(#)183	(#)1	(#)3	(#)57,834	(#)72	-	-	-
	Excluding I.M.	455,542	749	1	8	304,668	67	108,900	23	

Source: Socio Economic Profile II, Province of Samar, 1984
: JICA Study Team, August 1987
Remark: (#) Island Municipality (I.M.)

Table J.1.4. Inventory of Water Supply Resources

(units: %)

Area	Dug wells	Tube wells	River/Pond	Spring	Rain Collectors
Philippines	17.8	76.4	0.5	5.2	0.1
Region VIII	29.7	68.5	0.5	1.3	0

Source: Rural Water Supply and Sanitation Master Plan, December 1982

Table J.1.5. On-going Major Rural Water Supply Project

	Project Title	Description	Implement Schedule
1)	Samar Integrated Development Project (SIRDP) Water Supply Component LBRD and Australian Assisted	Drilling and Construction of about 2,000 deepwells, and rehabilitation of approximately 200 wells	1978-1987
2)	Overseas Economic cooperation Fund (OECF) - assisted Rural Water Supply Project (I), (II)	Drilling and Construction of 3,375 deep well and rehabilitation of 4,500 wells (I) Upgrading of 1,100 Level facilities into Level II System (II)	1980-1986 1981-1983
3)	First Rural Water Supply and Sanitation Project IBRD-assisted	Drilling and Construction of 4,500 Shallow wells, 2,300 deep wells and rehabilitation of 2,900 wells, and upgrading of 400 Level I facilities into Level II system	1983-1987

Source: Rural Water Supply and Sanitation Master Plan 1982.

Table J.1.6. Result of Water Quality Analysis

Station Name		Gandara River(1)	Sapinit River(2)	Kinabut-an Spring(3)	Mapaso Spring(4)
Collected Data (in 1987)		Aug. 19	Aug. 27	Aug. 18	Aug. 17
Turbidity	(mg/l)	5.8	11.5	0.6	0.7
True Colour	(mg/l)	8	180	1	1
Transparency	(cm)		15.3		
EC at 25°C	(S/cm)	349	268	365	569
pH Value		7.7	6.6	7.5	7.5
Hardness (5)	(mg/l)	-	87.6	180	254
T. Residue (6)	(mg/l)	-	233	213	330
P.P.C. (7)	(mg/l)	4.9	88.1	2.2	2.0
Choloride	(mg/l)	5.8	15.6	4.2	25.5
Ammonia Nitrogen	(mg/l)	0.1	0.69	0.1	0.1
Nitrite Nitrogen	(mg/l)	0.01	0.01	0.01	0.01
Nitrate Nitrogen	(mg/l)	0.2	0.2	0.5	0.1
Total Nitrogen	(mg/l)	-	2.23	-	-
T. Manganese	(mg/l)	0.01	0.37	0.01	0.01
T. Iron	(mg/l)	0.03	0.23	0.05	0.03
T. Chromium	(mg/l)	0.05	2.31	0.05	0.03
Colonies of Bacteria	(n/ml)	840	2,700	720	290
Coliform Bacteria	(MPN/100 ml)	79	920	49	350

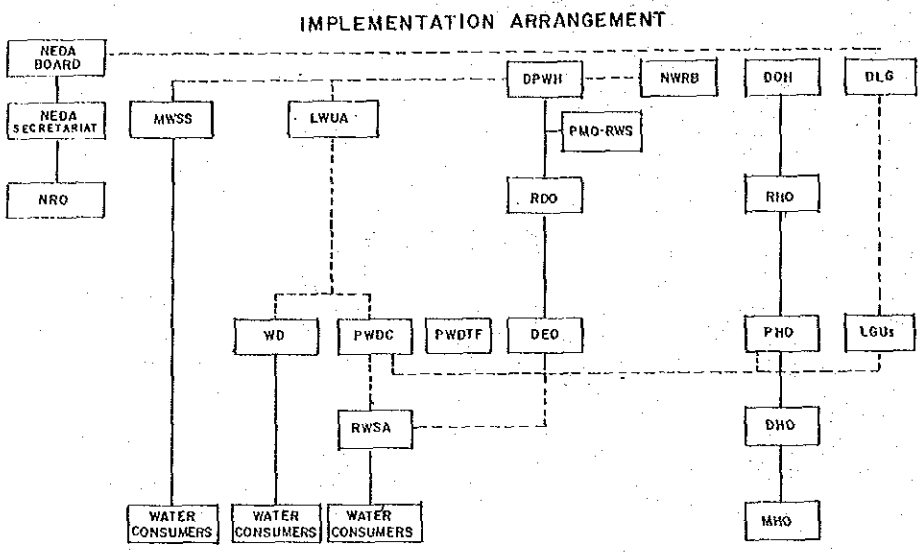
Note: (1) Blanca Aurora
(2) San Jorge at Sapinit Bridge
(3) Wright Patag Barangay
(4) Calbiga
(5) Total Hardness Expressed as Calcium Carbonat
(6) Total Residue on Evaporation
(7) Potassium Permanganate Consumed, COD Mn

Note: Analyser ... Japan Industrial water Supply Association
Date .... 6 October, 1987 No. 62-167

Table J.1.7. Water Supply Master Plan

No.	Project Schedule	Municipality	Population 1992	Population 1997	Population 2007	Service Rate 1992	Service Rate 1997	Service Rate 2007	Served Population 1992	Served Population 1997	Served Population 2007	Water Sauce
1	Short Term	Calbayog	126,779	134,399	146,911	75	80	85	95,000	107,500	125,000	Panas Fall
2	- do -	San Jorge	10,047	10,355	10,709	70	75	85	7,000	7,700	9,100	Tomobong Spring
		Gandara	30,692	33,066	37,228	75	80	85	23,000	26,400	31,600	- do -
3	- do -	Calbiga	14,264	14,191	13,790	75	80	85	10,700	11,300	11,700	Mapaso Spring
4	- do -	Basey	43,673	46,300	50,612	75	80	85	32,700	37,000	43,000	River
	Sub-total		225,455	238,311	259,250	75	80	85	168,400	189,900	220,400	
5	Medium Term	Pinabacdao	12,095	13,221	15,307	30	75	85	4,000	9,900	13,000	Deepwell
6	- do -	San Sebastian	5,394	5,688	6,156	20	75	85	1,100	4,300	5,200	- do -
7	- do -	Pagsanghan	9,452	10,807	13,625	21	75	85	2,300	8,100	11,600	- do -
	Sub-total		26,941	29,716	35,088	25	75	85	7,400	22,300	29,800	
8	Long Term	Catbalogan	75,667	82,706	95,758	33	33	85	24,900	27,300	81,400	Kinabutan
		Jiabong	13,873	15,015	17,062	18	18	85	2,500	2,700	14,500	
		Wright	27,698	30,240	34,978	31	31	85	8,600	9,400	29,700	
		Hoting	12,179	13,022	14,417	21	21	85	2,600	2,700	12,200	
		Hinabangan	10,908	10,884	10,606	6	6	85	700	700	9,000	
	Sub-total		140,325	151,867	172,821	28	28	85	39,300	42,800	146,800	
9	- do -	Taranguan	20,185	22,132	25,699	27	27	85	5,500	5,900	21,800	Deepwell
10	- do -	Santa Rita	21,940	21,918	21,379	25	25	85	5,500	5,500	18,200	- do -
11	- do -	Talalara	7,167	7,463	7,869	25	25	85	1,800	1,900	6,700	- do -
12	- do -	Villareal	24,167	25,552	27,727	27	27	85	6,500	6,900	23,600	- do -
13	- do -	Marabut	17,727	19,644	23,258	13	13	85	2,300	2,600	19,800	- do -
14	- do -	Matuguinao	6,065	6,472	7,152	12	12	85	700	800	6,100	- do -
15	- do -	San Josede Buan	9,399	11,476	16,284	19	19	85	1,800	2,200	13,800	- do -
16	- do -	Sta. Magarita	19,780	21,363	23,368	35	35	85	6,900	7,500	19,900	- do -
	Sub-total		266,755	287,887	325,557	26	26	85	70,300	76,100	276,700	
	Grand Total		519,151	555,914	619,895	47	53	85	246,100	293,300	526,900	

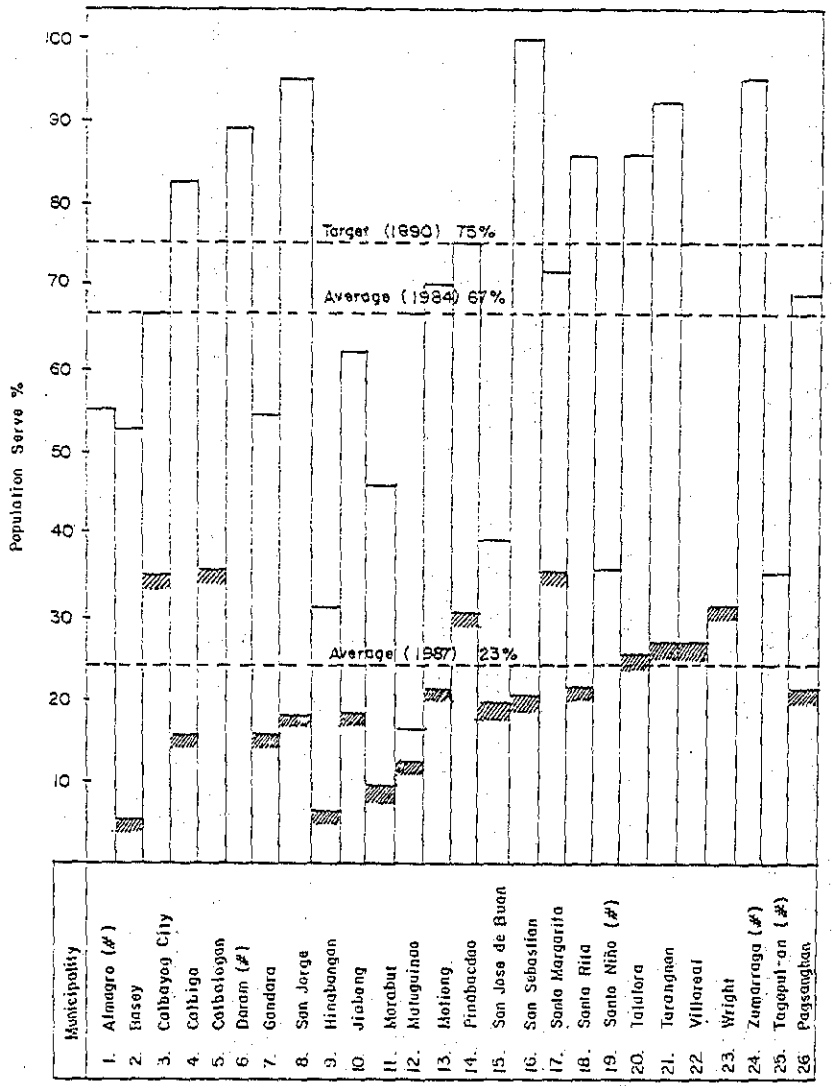
Figure J.1.1. Water Supply Implementation Arrangement



DPWH Department of Public Works & Highways.
MWSS - Metropolitan Waterworks & Sewerage Authority
LWUA - Local Water Utilities Administration
WD - Water District
RDO - Regional Directors Office
DEO - District Engineer's Office
DOH - Department of Health
RHO - Rural Health Office
PHO - Provincial Health Office
PWDC - Provincial Waterworks Development corporation
RWSA - Rural Waterworks Sanitation Corporation
DLG - Department of Local Government
LG - Local Government (Provincial & Municipal Government)

Source: DPWH 1988

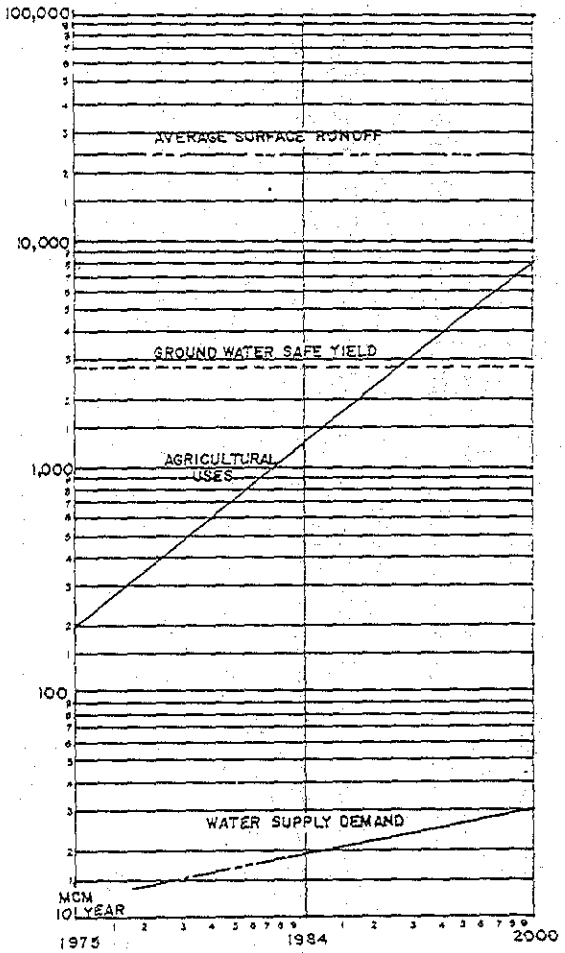
Figure J.1.2. Population Served by Municipality 1984 and 1987



Remarks: Source: Socio Economic Profile II, Province Samar, 1984

Present Water Supply Service Estimated Rate, 1987

Figure J.1.3. Water Requirement Forecast



Source : Comprehensive Development Plan for Samar Island.

J.2. Development Master Plan

J.2.1. Eradication of Water-Borne and Water-related Diseases.

Schistosomiasis is endemic to certain areas of Western Samar. The list of infection rate and exposed ranking of the municipality are as shown in Table J.2.1.

The Highest priority and next municipality is San Sebastion and San Jorge.

J.2.2. Uplifting the Living Condition

Uplifting the living condition is expressed by the water service rate.

On the field survey of August 1987 base on the population served are as shown in Figure J.1.2 at 1987, which is average 23 percent. Municipalities of a lower-than-average water service rate will be as shown same in Figure J.1.2, namely, lowest service rate is Basey and others 11 municiparities are lower than average service rate.

J.2.3. Alleviating the Burden of Water-fetching

Alleviating the burden of water-fetching is explained the number of effective wells per water-fetching area of one square kilometer. The list of drinking water fetching is as shown in Table J.2.2.

J.2.4. Framework of the water Supply Project

Framework of the water supply project will be divided into four categories as follows:

a) Eradication of water-borne and water-related diseases

b) Uplifting the living condition and promoting industries in the rural society

c) Community needs and cooperation

d) Alleviating the burden of water-fetching

These categories in the municipality are summarized as shown in Table J.2.3.

Table J.2.1. List of Endemic Schistosomiasis

	Municipality	Total Population 1984 (A)	Exposed Population 1986 (B)	Infection Rate % (B/A)	Total Area (A') km^2	Estimate Polluted Area (B')	Polluted Area Rate (B'/A')	Exposed Ranking
1.	San Sebastion	4,852	5,354	100	27.3	no data		1
2.	San Jorge	9,386	7,788	83	259.6	1.2	0.1	2
3.	Pagaanghan	6,848	4,506	65	77.4	no data		3
4.	Basey	40,339	19,662	48	572.7	15.7	2.7	4
5.	Pinabacdao	6,808	3,040	45	82.4	0.4	0.1	5
6.	Santa Margarita	18,947	8,095	43	144.4	0.7	0.1	6
7.	Gandara	26,292	9,276	35	414.4	46.8	11	7
8.	Tarangnan	17,171	5,617	33	81.5	no data		8
9.	Santa Rita	3,991	1,000	25	222.5	0.2	0.1	9
10.	Calbayog	110,678	25,627	23	921.3	7.2	0.8	10
11.	Calbiga	13,456	1,699	12	283.7	3.8	0.1	11
12.	Jiabong	12,599	931	7	67.7	1.7	0.2	12
13.	Catbalogan	63,468	2,302	4	119.8	no data		13

Source: Department of Health
Regional Health Office No. VIII
Tacloban City

Table J.2.2. List of Drinking Water Fetching

Municipality	Total Area km² (A)	Number of Wells: Existing 1984	Number of Wells: Utility 1987(B)	Fetching Rate (A/B)	Ranking
1. Almagro (#)	28.0	19	-	-	-
2. Basey	572.7	64	7	81.8	4
3. Calbayog City	921.3	69	35	26.3	8
4. Calbiga	283.7	36	7	40.5	6
5. Catbalogan	119.8	100	50	2.4	21
6. Daram (#)	103.4	94	-	-	-
7. Gandara	414.4	46	8	51.8	5
8. San Jorge	259.6	55	7	37.0	7
9. Hinabangan	372.2	5	1	372.2	1
10. Jiabong	67.7	24	7	9.7	15
11. Marabut	98.9	25	7	14.1	12
12. Matuguinao	364.2	3	2	182.1	3
13. Motiong	174.4	29	9	19.3	10
14. Pinabacdao	82.4	33	13	6.3	17
15. San Jose de Buan	366.9	2	1	366.9	2
16. San Sebastian	27.3	18	4	6.8	16
17. Santa Margarita	144.4	49	25	5.8	18
18. Santa Rita	222.5	75	23	9.7	14
19. Santa Rino (#)	31.7	12	-	-	-
20. Talalora	32.5	21	6	5.4	19
21. Tarangnan	81.5	58	17	4.8	20
22. Villareal	239.5	55	22	10.9	13
23. Wright	457.4	58	23	19.8	9
24. Zumarraga (#)	37.6	48	-	-	-
25. Tagapul-an (#)	27.9	10	-	-	-
26. Pagsanghan	77.4	17	5	15.5	11
Total	5,608.31	749			

Table J.2.3. Framework of the Water Supply Project

Municipality	(a) Eradication of Water - Related Diseases	(b) Uplifting Water Service Rate	(c) Community Needs & Coopera-tion	(d) Alleviate the Burden of Water Fetching	Total: X No.	4 X	3 X	2 X	1 X
1. Almagro (#)	-	-	-	-	-		-		
2. Basey	4 X	1 X	6 X	4 X	4 15	1			
3. Calbayog City	10 X	-	1 X	8 X	3 19		2		
4. Calbiga	11 X	6 X	2 X	6 X	4 25	4			
5. Catbalogan	15 X	-	5 X	-	2 18			5	
6. Daram (#)	-	-	-	-	-		-		
7. Gandara	7 X	3 X	4 X	3 X	4 25	3			
8. San Jorge	2 X	7 X	3 X	7 X	4 19	2			
9. Hinabangan	-	2 X	-	1 X	2 3			1	
10. Jiabong	12 X	8 X	-	-	2 20			7	
11. Marabut	-	5 X	-	12 X	2 17			4	
12. Matuguinao	-	4 X	-	3 X	2 7			2	
13. Motiong	-	11 X	-	10 X	2 21			8	
14. Pinabacdao	5 X	-	8 X	2 X	3 15	1			
15. San Jose de Buan	-	9 X	-	-	1 10				3
16. San Sebastian	1 X	10 X	9 X	-	3 25	3			
17. Santa Margarita	6 X	-	-	-	1 6				1
18. Santa Rita	9 X	-	-	-	1 9				2
19. Santo Nino (#)	-	-	-	-	- -		-		
20. Talalora	-	-	-	-	- -		-		
21. Tarangnan	8 X	-	10 X	-	2 18			6	
22. Villareal	-	-	-	13 X	1 13				4
23. Wright	-	-	7 X	9 X	2 16			5	
24. Zumarraga (#)	-	-	-	-	- -		-		
25. Tagapul-an (#)	-	-	-	-	- -		-		
26. Pagsanghan	3 X	12 X	-	11 X	3 25	4			

Note: The symbol of "X" means the developed municipality.
The "No." of "X" means the developed ranking.
The "X" No. is the total number of the developed municipality.

APPENDIX K. SOCIAL INFRASTRUCTURE

APPENDIX K. SOCIAL INFRASTRUCTURE

Appendix K SOCIAL INFRASTRUCTURE

K.1. Present Condition of Social Services

K.1.1. Health

Table K.1.1 Service Level of Health Facilities and Personnel

Item	Ratio to population			
	Samar	Calbayog	Region VIII	Philippine
Hospital bed	1: 1,762	1: 1,601	1: 1,051	1: 607
Doctor	1:11,945	1:10,662	1: 9,395	1: 6,423
Dentist	1:30,323	1:17,060	1:34,762	1:47,704
Nurse	1: 5,256	1: 5,331	1: 4,514	1: 5,245
Midwife	1: 3,617	1: 5,884	1: 4,122	1: 5,582
Sanitary inspector	1:10,374	1:21,325	1:16,210	1:28,282
Rural health unit	1:18,770	1:42,650	1;21,429	1:27,458
Barangay health station	1: 5,880	1: 7,750	1: 5,376	1: 6,841

Source: Regional and provincial DOH offices in Tacloban and Catbalogan

K.1.2. Education

Table K.1.2 Number of Schools in School Year 1986-87

Type of School	Division	Public	Private	Total
Elementary	Samar	591	1	592
School	Calbayog	139	-	139
Secondary	Samar	35	3	38
School	Calbayog	7	1	8
Tertiary	Samar	4	2	6
School	Calbayog	1	1	2

Source: DOECS offices in Catbalogan and Calbayog

Table K.1.3 Enrollment in School Year 1986-87

Type of School	Division	Public	Private	Total
Elementary	Samar	68,638	86	68,724
School	Calbayog	19,554	-	19,554
Secondary	Samar	12,492	439	12,931
School	Calbayog	2,009	537	2,546
Tertiary	Samar	1,487	685	2,172
School	Calbayog	467	1,765	2,232

Source: DOECS offices in Catbalogan and Calbayog

Table K.1.4 Number of Teachers in School Year 1986-87

Type of School	Division	Public	Private	Total
Elementary	Samar	2,747	6	2,753
School	Calbayog	701	-	701
Secondary	Samar	430	20	450
School	Calbayog	117	26	143
Tertiary	Samar	84	11	95
School	Calbayog	15	49	64

Source: DOECS offices in Catbalogan and Calbayog

Table K.1.5 Teacher to Pupils/Students Ratio

Division	Elementary School	Secondary School	Tertiary School
Samar	1: 25	1: 29	1: 23
Calbayog	1: 28	1: 23	1: 35

Note : The national standard for both schools: 1: 40
The ideal ratio : 1: 35

Source: DOECS offices in Tacloban, Catbalogan and Calbayog

Table K.1.6 Survival Rate

Area	Elementary School	Secondary School
Samar	51.5 (1987)	48.5 (1985)
Calbayog	54.5 (1986)	68.7 (1986)
Region VIII	51.9 (1987)	67.1 (1987)
Philippine	67 (1987)	79.3 (1987)

Source: Medium Term Philippine Development Plan (1987-92) and regional DOECS offices in Tacloban, Catbalogan and Calbayog

K.1.3. Housing

Table K.1.7 Number of Households by Type of Building

Type of Building	Number of Households		
	Urban area(%)	Rural area(%)	Total(%)
1. Single house	11,525 (91.6)	77,512 (97.7)	89,037 (96.8)
2. Duplex house	538 (4.3)	753 (0.9)	1,291 (1.4)
3. Apartment/Accessories/ Condominium/Row house/ etc.	230 (1.8)	392 (0.5)	622 (0.7)
4. Improvised (barong-barong)	133 (1.1)	657 (0.8)	790 (0.9)
5. Commercial/Industry/ Agricultural	123 (1.0)	15 (-)	138 (0.2)
6. Other housing unit: natural shelter, boat, etc.	6 (-)	14 (-)	20 (-)
7. Hotel/lodging house/ Dormitory/etc	15 (0.1)	5 (-)	20 (-)
8. Others (hospital, military camp)	10 (0.1)	11 (-)	21 (-)
9. Total	12,580 (100)	79,359 (100)	91,939 (100)

Source: National Census and Statistic Office in Tacloban, 1980

Table K.1.8 Construction Material of Roof and Outerwall

Type of Material	Urban area(%)	Rural area(%)	Total(%)
Roof			
Light Material	63.2	82.6	79.9
Strong Material	36.8	17.4	20.1
Outerwall			
Light Material	42.5	63.9	61.0
Strong Material	57.5	36.1	39.0

Source: National Census and Statistic Office in Tacloban, 1980

Table K.1.9 Number of Households by Type of Occupancy

Type of Occupancy	Number of Households		
	Urban area(%)	Rural area(%)	Total(%)
1. Owner	10,023 (79.7)	72,938 (91.9)	82,961 (90.2)
2. Tenant/Lessee	1,264 (10.0)	2,652 (3.3)	3,916 (4.3)
3. Subtenant/Sublessee	33 (0.3)	150 (0.2)	183 (0.2)
4. Rent free	1,260 (10.0)	3,619 (4.6)	4,879 (5.3)
Total	12,580 (100)	79,359 (100)	91,939 (100)

Source: National Census and Statistic Office in Tacloban, 1980

Table K.1.10 Number of Households by Floor Area

Floor area	Urban area(%)	Rural area(%)	Total(%)
1. Less than 30 sq.m	5,406 (43.0)	50,643 (63.8)	56,049 (60.9)
2. 30 - 49 sq.m	3,798 (30.2)	21,022(26.5)	24,820 (27.0)
3. 50 - 69 sq.m	1,422 (11.3)	4,233 (5.3)	5,655 (6.2)
4. 70 - 99 sq.m	805 (6.4)	1,804 (2.3)	2,609 (2.8)
5. 100 - 199 sq.m	851 (6.8)	1,227 (1.5)	2,078 (2.3)
6. 200 sq.m and over	298 (2.4)	430 (0.5)	728 (0.8)
Total	12,580 (100)	79,359 (100)	91,939 (100)

Source: National Census and Statistic Office in Tacloban, 1980

Table K.1.11 Number of Households by Type of Tenure

Type of Tenure	Number of Households		
	Urban area(%)	Rural area(%)	Total(%)
1. Owner	5,293 (52.8)	45,612 (62.5)	50,905(61.3)
2. Lessor/Sublessor	2,319 (23.1)	10,662 (14.6)	12,981 (15.6)
3. Farm lessor/Agricultural tenant of land owner	84 (0.8)	4,194 (5.8)	4,278 (5.2)
4. Other legal tenure	500 (5.0)	2,212 (3.0)	2,712 (3.3)
5. No tenure (Illegal etc.)	1,827 (18.2)	10,258 (14.1)	12,085 (14.6)
Total	10,023 (100)	72,938 (100)	82,961 (100)

Source: National Census and Statistic Office in Tacloban, 1980

K.1.4 Communication

Table K.1.12 Radio Telegraph Station

Station	Type of Service
1. Almagro	Radio
2. Basey	Radio
3. Calbayog City	RT Relay Station
4. Calbiga	Telegraph
5. Catbalogan	RT Relay Station, Telephone exchange
6. Daram	Radio
7. Gandara	Radio
8. Hinabangan	Telegraph
9. Jiabong	Telegraph
10. Marabut	Radio
11. Matuguinao	Radio
12. Motiong	Telegraph
13. Oquendo, Calbayog City	Telegraph
14. Pagsanghan	Radio
15. Pinabacdao	Telegraph
16. Sta. Margarita	Telegraph
17. Sta. Rita	Radio
18. Sta. Nino	Radio
19. Talalora	Radio
20. Tarangnan	Radio
21. Tinambacan, Calbayog City	Telegraph
22. Villareal	Telegraph
23. Wright	Telegraph
24. Zumarraga	Radio

Source: Bureau of Telecommunication in Catbalogan, 1987

Table K.1.13. Post Offices and Postal Offices

Location	No. of Post Offices	Postal Stations	No. of Person
Samar			
Catbalogan	2 post offices	1 postal station	44 (15)
Almagro	1 post office		2 (2)
Calbiga	ditto		4 (2)
Daram	ditto		3 (1)
Gandara	ditto		2 (1)
Hinabanan	ditto	1 postal station	3 (2)
Jiabong	ditto		3 (2)
Motiong	ditto		3 (2)
Pagsanhan	ditto		3 (1)
Pinabacdao	ditto		2 (2)
San Jorge	ditto		3 (2)
San Sebastian	ditto		1 (1)
Sta. Margarita	ditto	1 postal station	5 (3)
Sto. Nino	ditto		2 (2)
Tagapulan	ditto		2 (1)
Talalora	ditto		4 (3)
Tarangnan	ditto		2 (1)
Villareal	ditto	2 postal stations	10 (4)
Wright	ditto		4 (3)
Zumarraga	ditto		3 (2)
Calbayog	ditto		33 (21)
Tacloban			
Basey	ditto	3 postal stations	12 (9)
Marabut	ditto		2 (1)
Sta. Rita	ditto	3 postal stations	7 (6)
Total	25 post offices	14 postal stations	159 (88)

Source: Bureau of Postal Communication in Catbalogan, 1987

Note : The figures within parenthesis show number of carriers.

Appendix K.2. Proposed Social Services Scheme

K.2.1. Health

Table K.2.1 Target Ratio of Health Facilities

Target period	Hospital bed	BHS	Doctor	Nurse	Midwife	Dentist	Sanitary inspector
STP	1:1,000	1:5,300	1:10,000	1:4,500	1:4,000	1:26,000	1:16,000
MTP	1: 800	1:4,000	1: 8,200	1:4,500	1:4,000	1:26,000	1:16,000
LTP	1: 600	1:2,500	1: 6,400	1:4,500	1:4,000	1:26,000	1:16,000

Source: JICA Study Team, 1987
STP: Short term plan, MTP: Medium term plan,
LTP: Long term plan

Table K.2.2 Additionally Required Health Facilities and Manpower

District	Target period	Projected population	Hospital bed	BHS	Doctor	Nurse	Midwife	Dentist	Sanitary inspector	Solar power cold chain
Samar										
	1987	394,100	220	67	33	75	109	13	38	0
	STP	422,300	200	10	10	20	-	10	-	15
	MTP	452,000	360	40	10	30	10	20	-	-
	LTP	504,500	620	130	20	40	20	20	-	-
Calbayog										
	1987	170,700	105	22	16	32	29	10	8	0
	STP	181,200	80	20	10	10	20	-	10	5
	MTP	192,600	140	30	10	10	30	-	10	-
	LTP	211,000	250	60	20	20	30	-	10	-
Total										
	1987	564,800	325	89	49	107	138	23	46	0
	STP	603,500	230	30	20	30	20	10	10	20
	MTP	644,600	400	70	30	40	40	20	10	-
	LTP	715,500	870	190	70	50	50	20	10	

Note: Calbayog district includes Calbayog, Sta. Rita, Almagro, Sto. Nino and Tagapul-an. The figures in 1987 show number of existing facilities and personnel.
STP: Short term plan, MTP: Medium term plan
LTP: Long term plan

K.2.2. Education

Table K.2.3 Projected Enrollment

Type of School	Samar				Calbayog			
	1987	1992	1997	2007	1987	1992	1997	2007
Elementary	68,724	77,400	85,500	94,400	19,554	22,100	23,800	25,600
Secondary	12,931	15,100	15,700	16,300	2,545	4,350	4,370	4,500
Tertiary	2,172	2,340	2,520	2,700	2,232	2,400	2,600	2,800

Source: JICA Study Team, 1987.
Above figures are estimated based on the projection by Regional DOECS office in Tacloban.

Table K.2.4 School Classrooms

Category	Division	Planning Period		
		Short term	Medium term	Long term
Elementary School				
Construction	Samar	200	105	395
	Catabalogan	60	5	55
	Total	260	110	450
Rehabilitation	Samar	205	410	205
	Calbayog	65	130	65
	Total	270	540	270
Secondary School				
Construction	Samar	30	30	35
	Calbayog	10	-	25
	Total	40	30	60
Rehabilitation	Samar	30	60	30
	Calbayog	10	30	10
	Total	40	90	40
Tertiary School				
New college construction		1 school	1 school	1 school

Note: Comparing to existing enrollment of tertiary schools, approximately 1,100 enrollment will be expected to increase up to year 2,007.

K.2.3 Housing

Table K.2.5 Housing Program

Program	Program period			
	Short term	Medium term	Long term	Total
Social program				
1) Rural resettlement				
2) Urban resettlement	350	350	600	1,300
3) Site & infrastructure up-grading	* Data is not available			
Economic & open market housing program	1,000	1,000	2,000	4,000
Farmhouse development	4	0	0	4

Note; Above mentioned target is estimated based on the Medium Term Development Plan 1987-1992, Region VIII by JICA Study Team in 1987.

K.2.4. Communication

Table K.2.6 Proposed Telecommunication Project

Project	Project period			
	Short term	Medium term	Long term	Total
1. Establishment of NTTS station	4	24	-	28
2. Establishment of new telegraph station	4	-	-	4
3. Conversion from wire telegraph to HF/C radio station	10	-	-	10
4. Replacement of old and defective radio equipment	14	-	-	14
5. Repair of telecommunication building	7	7	10	24
6. Reconstruction of outside plant (damaged by fire) and repair of inside plant facilities for rural telephone exchange	1 (Catbalogan)	-	-	1
7. Expansion of outside plants facilities for rural telephone exchange	1 (Catbalogan)	-	4	5
8. Establishment of new telephone station	1 (Basey)	3 (Gandara, Daram and Wright)	-	4

Source: Regional Medium Term Development Plan and JICA Study Team, 1987

K.2.5. Postal Communication Development

Table K.2.7 Postal Communication Development

Project	Project period			
	Short term	Medium term	Long term	Total
1. Construction of city post office (Calbayog)	1	-	-	1
2. Construction of bureau owned building	26	-	-	26
3. Expansion of postal station in rural area	7	7	14	28

Source: Regional Medium Term Development Plan (1988-1992) and JICA Study Team, 1987.

Note : Number of postal stations is estimated based on the standard postal station with two carriers per station.

K.3. Schistosomiasis Control

Schistosomiasis is a debilitating and a locally endemic disease characterized by dysentery like symptoms, low-grade fever, blood streaked stool, caused by blood flukes know as Schistosomiasis and which is transmitted to man and a mammalian such as pigs, cows, dogs, cats, rats, etc. through a intermediate host of snail, the Oncomelania quadrasi. Schistosomiasis affects many farmers and their families by reducing working man-power, life span, etc.

There are three kinds of Schistosomiasis in the world, namely, Schistosomiasis Japonicum mainly spreaded in South-East Asia and Shina, S. Haematobium in Africa and the Middle East countries, and S. Mansoni in Central America, the West Indies, northern parts of South America and Africa. These Schistosomiasis were found in 74 countries of the world. About 200 million persons are infected and 500 to 600 million persons are exposed to infection because of poverty, ignorance, poor housing, substandard hygienic practices, and the availability of few, if any, sanitary facilities.

K.3.1. Life Cycle of Schistosomiasis Japonicum

The adult fluke, male with 12 to 20 mm length and 0.5 to 0.55 mm in width, and female with 15 to 26 mm length by 0.3 mm width, of S. Japonicum stays in the blood vessels of livers of a mammalian. The female fluke lay 100 eggs/laying in minimum with 12 times a day in the end branches of the blood vessels. Through small ulcers or sores in the wall of the intestines, the eggs go out to the intestines and are passed out with the feces.

The eggs have a strong resistibility to a drying condition. When the eggs meet fresh water, the eggs hatch into the larvae form of the parasitic termed as "Miracidium". The Miracidium has to reach at the snail as an intermediate host usually within 24 hr. In the event of the failures of the Miracidium to contact a suitable snail within 48 hr, the Miracidium dies.

After eight weeks, the cercariae, 0.25 to 0.32 mm including body and tail, are produced and leave the snail to look for men and other animals such as pigs, cows, carabaos, dogs, cats, rats and so on. However, the cercariae survive not longer than 48 hr. Infection takes place through skin penetration when men and mammalian animals come in contact with water infected with cercariae.

The cercariae, after through the skin, finds its ways into the blood circulation and thence to the intra-hepatic vessels when it grows to sexual maturity. Via the portal system worms and eggs migrate to the mesenteric veins where the female fluke lay their eggs. And then, this life cycle of schistosomiasis is repeated. It is said that the life span of worms in the body of man is about 20 years. (refer to Figure K.3.1)

K.3.2. Biology of Snail

A snail, Oncomelania quadrasi, as an intermediate host of Schistosomiasis japonicum, is living in a shallow water area where many grasses are growing. The size of the snail is 4.5 mm long of male and 5.0 mm long of female in average, that is, approximately the size is as same as a grain of paddy with black or dark brown color.

According to the results of the laboratory observation by B.W. Halstead and E.D. Wagner in 1954, the maximum rate of egg-laying was 0.34 eggs per female per day. In round numbers, the figure of two eggs every five days is a good estimate of a female snail's output. Inasmuch as most eggs are laid above the water, the advantages of egg-laying at night are obvious. A survival rate of about 20% at 70 days after hatching. After 78 days roughly, the snail reaches at the maturity age. It has been estimated that the population would recover its original density from a 75% killing in 90 days, from 85% killing in 105 days, and from 95% in 175 days.

The snail feed on the algae and decaying organic matter during a night time. During the day time, the snail moves into the nearest shade. The snail are usually living in the shallow water area or water surface according to the field observation. (refer to Tables K.3.1 and K.3.2)

K.3.3. Schistosomiasis in Samar Province

The schistosomiasis infected areas are surveyed and by DOH. 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 infected 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. According to the recent field survey by DOH, the above number is increase in 1987, however, the details are not yet compiled at present. The farmers can not make Schistosomiasis control because of lack of budget and poor knowledge about the control.

K.3.4. Schistosomiasis Control

In general, vegetation removal, drainage, earth filling, flooding and ponding, improvement rice farming technique, chemical control and biological control are considered to control Schistosomiasis in the Study Area.

Considering the life cycle of Schistosomiasis, the interruption of snail multiplication and the reduction of number of snail or snail colony are more effective. In the case of the no snail as intermediate host of Schistosomiasis, the Miracidium can not develop to the cercariae which can penetrate into man and mammalian bodies.

The effectiveness of vegetation removal or canal cleaning is quite substantial in terms of reduction of snail population. The principal difficulty with this control method is the frequency necessary to be repeated.

Drainage improvement such as stream canalization, seepage control, introduction of diversion and intercepting channels, canal lining, improvement and introduction of drainage and irrigation schemes are more effective to destroy the multiplication environment for snails. Especially, the introduction of drainage canals in the low lying area which forms a swampy area with much grasses, will play a very important role to reduce the above conditions.

The methods of earth filling, and flooding and ponding are also one of the countermeasures of Schistosomiasis control. Both methods directly dissolve the affected area by filling-up and digging where the area is comparatively small. After using this method, the area will be changed to upland and/or fish pond from existing low laying area including a paddy field.

The chemical input to a colony of snails is one of the good countermeasures. However, it is rather difficult that all snails in the colony are killed. After flooding, only small number of snails will increase by the former situation.

Table K.3.1. Vertical Distribution of O. Quadrasi in Naliwatan Creek

Snail Position (M : F)	Total Collected		Sex		Sex Ratio
	Number	%	Male	Female	
Above 5 cm	10	3.4	5	5	1 : 1
0 to 5 cm	92	31.1	49	43	1 : 0.88
On surface	118	39.9	53	65	1 : 1.23
In mud	76	25.6	27	49	1 : 1.84
Total	296	100.0	134	162	1 : 1.21

Note : Data taken from 10 ring and tube samples taken from 8:30 AM to 9:45 AM, 2nd of August, 1955

Source: Studies on Schistosoma Japonicum Infection in the Philippines by Dr. T.P. Pesigan and others

Table K.3.2. Relation between Depth of Water and Density of O. Quadrasi in Binog Stream

Depth of Water	Number of Samples	Average Number of Live Snail per Sample
0 - 0.9 cm	25	3.8
1.0 - 2.9 cm	13	2.8
3.0 - 5.9 cm	9	0.2
6.0 - 15.0 cm	7	0.6

Source: Same as above

Table K.3.3. Magnitude of Schistosomiasis in Samar Province

Municipality	No. of Barangay	No. of Endmic Barangay	Endmic Rate	No. of Colonies	No. of Affected Area (ha)	S.Caces*
Catbalogan	58	7	12	10	53	1,550
Tarangan	40	5	13	11	199	761
San Jorge	30	22	73	45	268	6,269
Gandara	59	40	83	52	305	6,000**
Pagsangjan	12	2	17	2	46	3,546
Sta. Margarita	33	1	3	1	0	1,308
Calbayog C.	81	57	70	124	617	18,242
Jiabong	34	1	3	2	1	801
Calbiga	39	2	5	2	46	1,031
Pinabacdao	23	3	13	3	42	9,389
Sta. Rita	34	3	9	6	265	853
Basey	27	21+	78	49+	615+	7,218
Total	470	164	35	307	2,467	56,977

Note : As of 1986
F.N ... Found Negative
+ ..... In 1987, new endemic barangay and area were found in 1987 by the DOH field survey
* ..... As of 1980
** ..... Approximate figure, due to not clear figure in original data

Source: Regional office, DOH

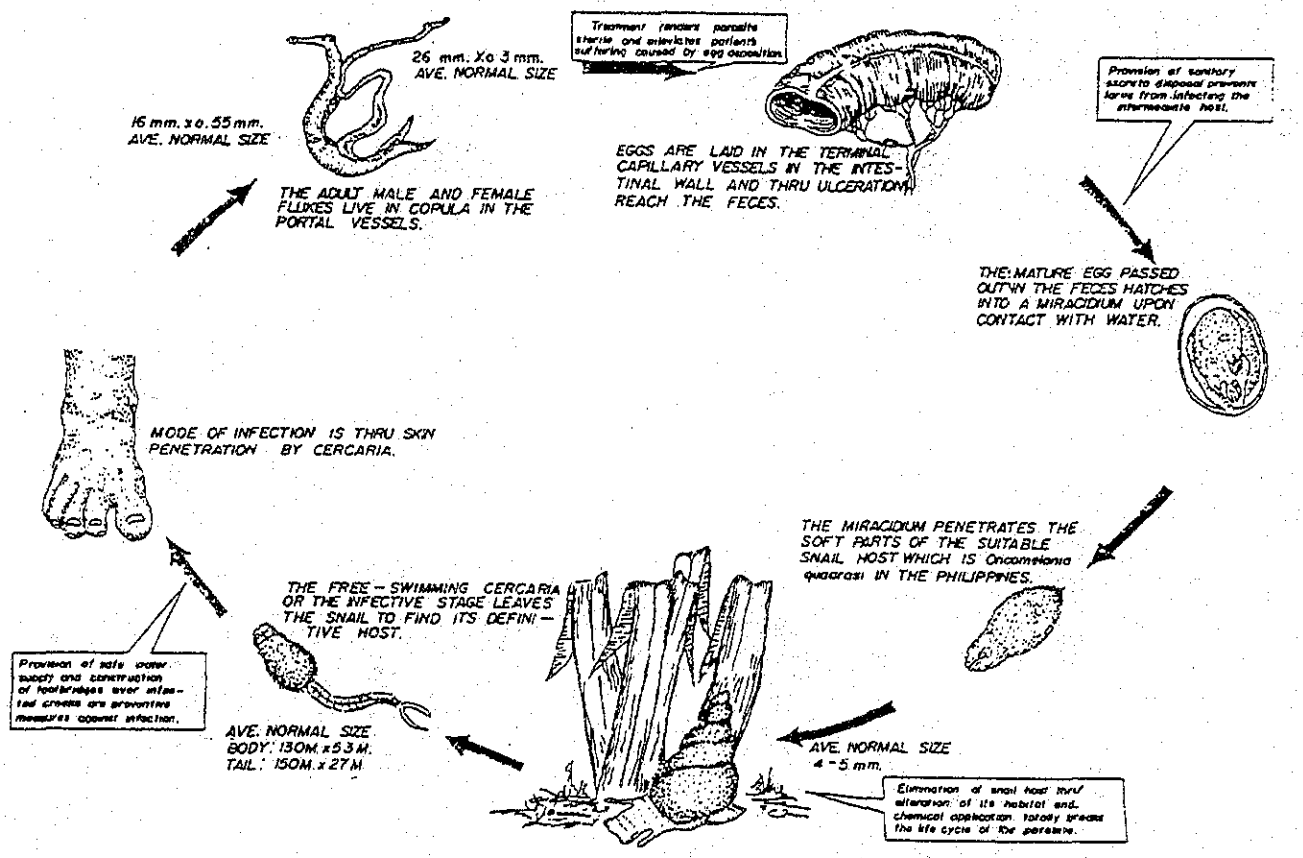


Figure K.3.1. Life Cycle of Schistosoma japonicum

(Also shown are basic principles of control)

Source: Technical Guide for Schistosomiasis Control in the Philippines. JICA, May, 1980

APPENDIX L. RURAL SOCIOLOGY AND FARMERS' ORGANIZATION

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Appendix L.1. Cooperative Farmers' Organizations in Samar Province

Table L.1.1. Area Marketing & Cooperatives in Samar Province
(As of End of September, 1987)

Area Marketing

Municipality	Name of Area Marketing	Yr. Organized/ Re-Organized	Active/ (A) Dormant (D)	Number of Membership		Nature of Activity	Paid-up Capital	Production Loan		
				Active	In-Active			Amount Provided	Amount Recovered	Recovery Rate (%)
Calbayog City	Calmarco - Area Marketing	9-8-82	A	27 SNs		Marketing of Agricultural inputs	₱42,000.00	None	-	-
Gandara, Samar	Samarco - Area Marketing	12-8-80	A	76 SNs	-	Supply-Consumber Goods /Agric'l. inputs	₱108,836.78	₱200,000.00	₱16,000.00	8%
Co-operatives:	Name of Co-operative									
Calbayog City	Christ The King College Credit Cooperative	8-26-81	A	54	21	Extending Credit to members (Credit Coop.)	₱35,872.75	None	-	-
	OCPA-Agro. Industry Coconut Cooperative	1964-org. 1972-re-org.	A	141	-	Marketing of Copra (Buy-Sell)	₱115,000.00	None	-	-
STA. Margarita	Napuro, Palale, Solsogon Fish Producers Multi-Purpose Cooperative, Inc.	7-9-87	A	32	-	Inland Fishing	₱5,000.00	None	-	-
	Sta. Margarita Rice Grains Retailer Multi-Purpose Cooperative, Inc.	9-26-87	A	41	-	Rice Grains Retailing	₱5,000.00	None	-	-
San Jorge	San Jorge Teachers Credit Cooperative, Inc.	12-28-83	A	98	11	Extending Credit to Coop. members (Credit Coop.)	₱15,200.00	None	-	-
Catbalogan	Samar DLG Credit Coop., Inc.	4-14-80	A	45	5	Extending Credit to Coop. members (Credit Coop.)	₱61,742.81	None	-	-
	Samar DLG Consumers Coop., Inc.	12-30-80	A	56	1	Supply of Consumer-Goods	₱8,811.98	None	-	-
	SAMASAKA Fishermen Multi-Purpose Cooperative, Inc.	9-18-87	A	56	-	Marketing of fish	₱15,000.00	None	-	-
Hinabangan	Babacay Pyrite Employees Cooperative, Inc.	7-2-86	A	25	-	Supply of Consumer-Goods/Canteen	₱5,250.00	₱19,500.00	-	-
Pinabacdao	Samar Farmers Multi-Purpose Cooperative, Inc.	8-20-87	A	26	-	Marketing of Palay (Buy/Sell) Supply of Consumer-Goods	₱5,200.00	None	-	-
Sta. Rita	Anibongon Farmers Multi-Purpose Cooperative, Inc.	1987	A	30	-	Marketing of Palay/ Supply of Consumer-Goods	₱5,000.00	None	-	-
Villareal	Saint Rose of Lima Credit Cooperative, Inc.	7-9-79	A	212	89	Extending Credit to Coop. members (Credit Coop.)	₱167,376.29	None	-	-
Marabut	Legaspi Rattan Mgkt. Cooperative, Inc.	"NA"	D	"NA"		Marketing/Processing of Rattan products	"NA"	None	-	-

Source: Department of Agriculture, Catabalogan, Samar.

Table L.1.2. Samahang Nayon (Pre-Coop) in Samar Province
(As of End September, 1987)

Municipality	Name of Samahang Nayon	Yr. Organized	Active/ Dormant	Number of Membership		Nature of Activity	Capital Formation Paid up Capital	Production Loan		
				Active	In-Active			Amount Provided	Amount Recovered	Recovery Rate
Catbalogan City	Cagbayang SN Coop. Inc.	July 4, 1974	Active	50	-	Supply Agricultural Inputs and Consumer goods	P27,043.61	-	-	-
	Cabacungan SN Coop. Inc.	Oct. 25, 1974	Dorm.	40	-	Service	403.10	-	-	-
	Easwagan Parent SN Coop. Inc.	Nov. 1, 1974	Dorm.	28	-	None	480.00	-	-	-
	Cagnanipong SN Coop. Inc.	May 20, 1975	Dorm.	24	-	None	531.00	-	-	-
	Sigo SN Coop. Inc.	May 20, 1975	Dorm.	32	-	None	400.00	-	-	-
	Pita SN Coop. Inc.	Nov. 1, 1974	Dorm.	36	-	None	540.00	-	-	-
	Macatingog SN Coop. Inc.	May 20, 1975	Dorm.	40	-	None	795.00	-	-	-
	Bagud SN Coop. Inc.	Jan. 4, 1974	Active	-	40	Consumer	363.60	-	-	-
	Bantican SN Coop. Inc.	June 10, 1974	Active	-	30	Consumer	570.00	-	-	-
	Lonoy SN Coop. Inc.	July 9, 1976	Dorm.	20	29	None	371.00	-	-	-
	Bagtang SN Coop. Inc.	May 14, 1976	Dorm.	-	34	None	496.60	-	-	-
	Carayman SN Coop. Inc.	Nov. 1, 1974	Active	26	-	Consumer	378.60	-	-	-
	Bayo SN Coop. Inc.	May 14, 1976	Dorm.	-	35	None	455.00	-	-	-
	Panlayahan SN Coop. Inc.	May 20, 1976	Dorm.	-	35	None	525.00	-	-	-
	Tinambacan SN Coop. Inc.	Dec. 24, 1974	Active	40	-	Consumer	586.00	-	-	-
	Tabunan SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	25	None	364.00	-	-	-
	Dagum SN Coop. Inc.	Jan. 4, 1974	Dorm.	-	27	None	393.00	-	-	-
	Pinamurian SN Coop. Inc.	July 5, 1975	Dorm.	-	45	None	679.00	-	-	-
	Limarayan SN Coop. Inc.	July 9, 1976	Active	28	-	Consumer	377.00	-	-	-
	San Joaquin SN Coop. Inc.	Dec. 24, 1974	Dorm.	-	34	None	425.00	-	-	-
	Pilar SN Coop. Inc.	Dec. 23, 1974	Active	50	1	Consumer	745.00	-	-	-
	Cabatuan SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	52	None	815.00	-	-	-
	Hagnaya SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	36	None	483.00	-	-	-
	Santa SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	29	None	450.00	-	-	-
	Bagacay SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	27	None	393.60	-	-	-
	Bagumbo SN Coop. Inc.	Dec. 18, 1973	Active	28	-	Consumer	404.35	-	-	-
	Cuperocan SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	25	None	363.00	-	-	-
	Sinibuan Occ. SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	27	None	378.00	-	-	-
	Natobato SN Coop. Inc.	Dec. 18, 1973	Active	40	4	Consumer	618.00	-	-	-
	Bagaho SN Coop. Inc.	Jan. 28, 1974	Dorm.	-	32	None	468.80	-	-	-
	Ell-Ell SN Coop. Inc.	Mar. 28, 1974	Dorm.	-	31	None	481.00	-	-	-
	San Antonio SN Coop. Inc.	July 5, 1977	Dorm.	-	40	None	465.76	-	-	-
	Longab SN Coop. Inc.	Nov. 16, 1977	Active	30	-	Consumer	133.00	-	-	-
	Amampacang SN Coop. Inc.	Mar. 28, 1974	Dorm.	-	29	None	423.00	-	-	-
	Buras SN Coop. Inc.	May 14, 1976	Dorm.	-	35	None	450.00	-	-	-
	San Policarpo SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	33	None	453.60	-	-	-
	Anlitag SN Coop. Inc.	Dec. 18, 1983	Active	30	-	Consumer	453.60	-	-	-
	Matayuju SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	27	None	393.60	-	-	-
	Dinagan SN Coop. Inc.	Mar. 14, 1979	Dorm.	-	29	None	189.00	-	-	-
	Cagnipa SN Coop. Inc.	Dec. 12, 1977	Dorm.	-	17	None	410.00	-	-	-
	Cadgerom SN Coop. Inc.	Dec. 18, 1973	Active	27	-	Consumer	378.60	-	-	-
	Hijaga SN Coop. Inc.	Oct. 23, 1973	Active	32	-	Consumer	480.00	-	-	-
	Guinbaoyan SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	35	None	363.60	-	-	-
	Higasan SN Coop. Inc.	July 5, 1977	Active	38	-	Consumer	586.45	-	-	-
	Bone SN Coop. Inc.	May 29, 1974	Dorm.	-	30	None	393.60	-	-	-
	Cayboga SN Coop. Inc.	May 29, 1974	Dorm.	-	28	None	408.00	-	-	-
	Ontero SN Coop. Inc.	Jan. 28, 1974	Active	25	-	Consumer	363.60	-	-	-
	Cagsaljosao SN Coop. Inc.	Dec. 18, 1973	Dorm.	-	26	None	396.60	-	-	-
	Trinidad SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	40	None	573.00	-	-	-
	Tomaliguez SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	26	None	378.60	-	-	-
	Otera SN Coop. Inc.	July 5, 1977	Dorm.	-	48	None	769.46	-	-	-
	Guiwan SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	28	None	420.00	-	-	-
	Hamtamirog SN Coop. Inc.	July 5, 1977	Dorm.	-	58	None	843.00	-	-	-
	Sinibuan SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	25	None	363.60	-	-	-
	Nawacat SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	30	None	438.60	-	-	-
	Quiuendo SN Coop. Inc.	May 14, 1976	Dorm.	-	29	None	693.00	-	-	-
	Turanucan SN Coop. Inc.	Mar. 22, 1974	Active	40	-	Consumer	693.00	-	-	-
	Salajog SN Coop. Inc.	Dec. 18, 1973	Active	72	-	Consumer	1,083.60	-	-	-
Sta.Margarita	Cautod SN Coop. Inc.	May 29, 1974	Active	24	-	Swine raising	1,317.00	-	-	-
	Solsogan SN Coop. Inc.	Oct. 12, 1973	Active	16	-	Extension Credit	1,700.00	-	-	-
	Nipaco SN Coop. Inc.	Oct. 4, 1973	Active	31	-	Extension of Credit	1,500.00	-	-	-
	Mahhon SN Coop. Inc.	Oct. 9, 1973	Dorm.	-	54	None	5,689.45	-	-	-
	Lambao SN Coop. Inc.	Oct. 9, 1973	Dorm.	-	31	None	1,014.00	-	-	-
	Tacrogulao SN Coop.	Oct. 12, 1973	Dorm.	-	78	None	3,000.00	-	-	-
	Bahud SN Coop. Inc.	Oct. 9, 1973	Dorm.	-	85	None	6,373.20	-	-	-
	Ilo SN Coop. Inc.	Oct. 9, 1973	Dorm.	-	48	None	11,512.00	-	-	-
	Solsogan SN Coop. Inc.	Oct. 12, 1973	Dorm.	-	72	None	5,580.00	-	-	-
	Binabod SN Coop. Inc.	Oct. 9, 1973	Dorm.	-	31	None	415.00	-	-	-
	Can-ipatan SN Coop. Inc.	Oct. 9, 1973	Dorm.	-	25	None	350.00	-	-	-
	Polete SN Shop, Inc.	Oct. 9, 1973	Dorm.	-	34	None	467.35	-	-	-
	Curry SN Coop. Inc.	May 4, 1974	Dorm.	-	34	None	474.50	-	-	-

Municipality	Name of Samahang Nayon	Yr. Organized	Active/ Dormant	Number of Membership		Nature of Activity	Capital Formation Paid up Capital	Production Loan		
				Active	In-Active			Amount Provided	Amount Recovered	Recovery Rate
(Cont.)										
Gandara	Sacubi SN Coop. Inc.	Sept. 15, 1986	Active	34	-	Consumer goods	P10,000.00	-	-	-
	Casabalahan SN Coop. Inc.	Mar. 21, 1974	Dorm.	-	36	None	555.00	-	-	-
	Sto Niño SN Coop. Inc.	Dec. 26, 1978	Dorm.	-	28	None	516.00	-	-	-
	Hampton SN Coop. Inc.	Jan. 4, 1974	Dorm.	-	32	None	576.00	-	-	-
	Casandig SN Coop. Inc.	Oct. 25, 1974	Dorm.	-	55	None	180.00	-	-	-
	Barahatay SN Coop. Inc.	Dec. 28, 1974	Active	25	-	Consumer goods	181.00	-	-	-
	Pizarro SN Coop. Inc.	Dec. 25, 1976	Dorm.	-	53	None	488.00	-	-	-
	Ngosa SN Coop. Inc.	June 28, 1974	Dorm.	-	58	None	165.00	-	-	-
	Concepcion SN Coop. Inc.	Mar. 24, 1975	Active	50	-	Consumer goods	655.00	-	-	-
	San Agustin SN Coop. Inc.	Apr. 17, 1975	Dorm.	-	26	None	226.60	-	-	-
	Hapnitanan SN Coop. Inc.	Oct. 11, 1975	Dorm.	-	35	None	337.04	-	-	-
	San Pilapil SN Coop. Inc.	Apr. 8, 1975	Dorm.	-	34	None	294.40	-	-	-
	Tagnao SN Coop. Inc.	Apr. 22, 1974	Dorm.	-	25	None	375.00	-	-	-
San Jorge	Bulao SN Coop. Inc.	Jan. 28, 1974	Active	25	-	Carabao for rent	-	P50,000.00	None	None
	Pelagan SN Coop. Inc.	Dec. 23, 1974	Dorm.	-	26	None	240.00	-	-	-
	Quezon SN Coop. Inc.	Dec. 23, 1974	Dorm.	-	25	None	237.10	-	-	-
	Erenas SN Coop. Inc.	Oct. 23, 1973	Dorm.	-	30	None	375.00	-	-	-
	Rosalia SN Coop. Inc.	July 30, 1974	Dorm.	-	28	None	-	-	-	-
	Hobuhoy SN Coop. Inc.	Nov. 26, 1974	Dorm.	-	48	None	-	-	-	-
	Cantaguic SN Coop. Inc.	Dec. 23, 1974	Dorm.	-	25	None	-	-	-	-
	Buenavista SN Coop. Inc.	Jan. 28, 1975	Dorm.	-	25	None	-	-	-	-
	Danjon SN Coop. Inc.	July 22, 1976	Dorm.	-	26	None	-	-	-	-
Pagsanghan	Villahermosa SN Coop. Inc.	Feb. 12, 1974	Dorm.	-	27	None	248.00	-	-	-
	Pagsanghan Pub. SN Coop. Inc.	Apr. 22, 1974	Dorm.	-	28	None	240.00	-	-	-
	Calistoma SN Coop. Inc.	Apr. 22, 1974	Active	27	-	Rice retailer	255.00	-	-	-
	Buenos Aires SN Coop. Inc	May 16, 1974	Dorm.	-	31	None	235.00	-	-	-
	San Luis SN Coop. Inc.	May 16, 1974	Dorm.	-	26	None	255.00	-	-	-
	Pange SN Coop. Inc.	July 19, 1976	Dorm.	-	25	None	185.00	-	-	-
Tarangnan	Castigo SN Coop. Inc.	May 31, 1974	Active	34	-	Grain retailer	320.00	-	-	-
	Dapdap SN Coop. Inc.	Apr. 22, 1974	Dorm.	-	29	None	224.00	-	-	-
	Paju SN Coop. Inc.	May 16, 1974	Dorm.	-	33	None	305.00	-	-	-
	Paleria SN Coop. Inc.	May 16, 1974	Dorm.	-	31	None	285.00	-	-	-
	Sta. Cruz SN Coop. Inc.	May 16, 1974	Dorm.	-	34	None	320.00	-	-	-
	Imelda SN Coop. Inc.	May 16, 1974	Active	40	-	Consumer goods	405.00	-	-	-
	Bahay SN Coop. Inc.	May 16, 1974	Dorm.	-	35	None	315.00	-	-	-
	Hajacan SN Coop. Inc.	May 29, 1974	Dorm.	-	28	None	255.00	-	-	-
	Binalayan SN Coop. Inc.	June 24, 1974	Dorm.	-	26	None	235.00	-	-	-
	Mangarez SN Coop. Inc.	June 28, 1974	Active	41	-	Consumer goods	410.00	-	-	-
	Taliaga SN Coop. Inc.	July 12, 1974	Dorm.	-	35	None	550.00	-	-	-
	San Francisco SN Coop. Inc.	Sept. 14, 1974	Dorm.	-	67	None	670.00	-	-	-
	Bitoon SN Coop. Inc.	Aug. 28, 1974	Dorm.	-	39	None	390.00	-	-	-
	Libucan DACU SN Coop. Inc.	Oct. 28, 1974	Dorm.	-	32	None	320.00	-	-	-
	Cayulong SN Coop. Inc.	Oct. 28, 1974	Dorm.	-	31	None	270.00	-	-	-
	Bongo SN Coop. Inc.	Nov. 26, 1974	Dorm.	-	38	None	380.00	-	-	-
	Bang Fishermen SN Coop. Inc.	May 29, 1976	Dorm.	-	25	None	200.00	-	-	-
	San Vicente SN Coop Inc.	May 29, 1976	Dorm.	-	25	None	200.00	-	-	-
	Cuinmeasan SN Coop. Inc.	July 13, 1976	Active	41	-	Consumer goods	1,650.00	-	-	-
	Otsra SN Coop. Inc.	June 15, 1976	Active	52	-	Consumer goods	1,350.00	-	-	-
	Blatikan SN Coop. Inc.	June 24, 1975	Dorm.	-	24	None	240.00	-	-	-
Catbalogan	Muñoz SN Coop. Inc.	June 7, 1974	Active	90	-	Credit	5,000.00	-	-	-
	Darahuway Daco SN Coop. Inc.	June 6, 1974	Dorm.	-	28	None	350.00	-	-	-
	Bunlan SN Coop. Inc.	June 5, 1974	Dorm.	-	25	None	180.00	-	-	-
	Tarahocan SN Coop. Inc.	Apr. 28, 1975	Dorm.	-	25	None	187.00	-	-	-
	Hallobrea SN Coop. Inc.	Dec. 28, 1974	Dorm.	-	40	None	346.00	-	-	-
	Nsantas SN Coop. Inc.	May 20, 1975	Dorm.	-	27	None	150.00	-	-	-
	Pangdan SN Coop. Inc.	June 24, 1974	Dorm.	-	36	None	400.00	-	-	-
	Hanlang SN Coop. Inc.	July 1, 1976	Dorm.	-	28	None	220.00	-	-	-
	Cagutiran SN Coop. Inc.	Jan. 5, 1977	Active	60	-	Sari-sari store	575.00	-	-	-
	Bulo-an SN Coop. Inc.	July 23, 1974	Dorm.	-	29	None	235.00	-	-	-
	Payao SN Coop. Inc.	Sept. 5, 1977	Dorm.	-	34	None	340.00	-	-	-
	San Andres SN Coop. Inc.	Mar. 22, 1977	Dorm.	-	29	None	2,000.00	-	-	-
	Guinsiyanan SN Coop. Inc.	July 1, 1974	Active	53	-	Sari-sari store	1,155.00	-	-	-
	Buno-anan SN Coop. Inc.	Mar. 22, 1974	Active	50	-	Sari-sari store	5,221.48	-	-	-
	Sitanga SN Coop. Inc.	May 6, 1977	Dorm.	-	50	None	735.00	-	-	-
	Honhon SN Coop. Inc.	July 22, 1974	Dorm.	-	25	None	284.00	-	-	-
	Rawa SN Coop. Inc.	July 30, 1974	Dorm.	-	32	None	310.00	-	-	-
	Catpan SN Coop. Inc.	July 22, 1974	Dorm.	-	25	None	284.00	-	-	-
	Darahuway Gayl SN Coop. Inc.	Jan. 15, 1974	Dorm.	-	26	None	245.00	-	-	-
	Canlawaan SN Coop. Inc.	Apr. 22, 1974	Dorm.	-	30	None	270.00	-	-	-
	Guinsiangan SN Coop. Inc.	Mar. 21, 1974	Dorm.	-	28	None	300.00	-	-	-
	Hercules SN Coop. Inc.	July 22, 1974	Dorm.	-	24	None	240.00	-	-	-

Municipality	Name of Samahang Nayon	Yr. Organized	Active/ Dormant	Number of Membership		Nature of Activity	Capital Formation Paid up Capital	Production Loan		
				Active	In-Active			Amount Provided	Amount Recovered	Recovery Rate
- Cont.										
Cuthalingan	Cinco SN Coop. Inc.	July 22, 1974	Active	44	-	Sari-sari store	₱300.00	-	-	-
	Tagnugan SN Coop. Inc.	Jan. 15, 1975	Dorm.	-	25	None	300.00	-	-	-
Wright	Batag SN Coop. Inc.	Jan. 4, 1974	Dorm.	-	24	None	390.00	-	-	-
	Cannadig SN Coop. Inc.	Jan. 12, 1974	Dorm.	-	24	None	390.00	-	-	-
	Tutubigan SN Coop. Inc.	Jan. 18, 1974	Dorm.	-	29	None	435.00	-	-	-
	Parangan SN Coop. Inc.	Jan. 28, 1974	Dorm.	-	24	None	390.00	-	-	-
	Lawaan SN Coop. Inc.	May 16, 1974	Active	56	-	Sari-sari store	70.00	-	-	-
	Penuit SN Coop. Inc.	Sept.30, 1974	Dorm.	-	28	None	390.00	-	-	-
	Tigbawan SN Coop. Inc.	Oct. 14, 1976	Dorm.	-	26	None	390.00	-	-	-
	Lokilokan SN Coop. Inc.	Jan. 28, 1975	Dorm.	-	36	None	420.00	-	-	-
	Tula SN Coop. Inc.	Mar. 14, 1975	Active	27	-	Sari-sari store	405.00	-	-	-
	Buray SN Coop. Inc.	Apr. 30, 1975	Active	106	-	Sari-sari store	21,160.00	-	-	-
	Canigquic SN Coop. Inc.	June 30, 1975	Dorm.	-	41	None	615.00	-	-	-
	Hayloho SN Coop. Inc.	June 30, 1975	Dorm.	-	25	None	375.00	-	-	-
	Sto Niño SN Coop. Inc.	Sept. 3, 1975	Dorm.	-	31	None	465.00	-	-	-
	Bato SN Coop. Inc.	Dec. 11, 1975	Dorm.	-	30	None	450.00	-	-	-
Winbongon	Yahon SN Coop. Inc.	Nov. 26, 1974	Dorm.	-	25	None	375.00	-	-	-
	Oweda SN Coop. Inc.	Dec. 23, 1974	Dorm.	-	26	None	390.00	-	-	-
	Bocalan SN Coop. Inc.	Jan. 15, 1975	Dorm.	-	27	None	405.00	-	-	-
	Canano SN Coop. Inc.	Jan. 31, 1975	Active	30	-	Sari-sari store	450.00	-	-	-
	Limao SN Coop. Inc.	Apr. 25, 1975	Dorm.	-	25	None	375.00	-	-	-
	Canvaloban SN Coop. Inc.	June 24, 1975	Dorm.	-	25	None	375.00	-	-	-
	San Rafael SN Coop. Inc.	Dec. 20, 1976	Dorm.	-	25	None	375.00	-	-	-
	Bagacay SN Coop. Inc.	Oct. 7, 1976	Dorm.	-	26	None	390.00	-	-	-
San Sebastian	Bantod SN Coop. Inc.	Jan. 4, 1974	Dorm.	-	27	None	450.00	-	-	-
	Hilawan SN Coop. Inc.	Aug. 30, 1974	Active	31	-	Sari-sari store	465.00	-	-	-
	Comanhagay SN Coop. Inc.	May 16, 1974	Active	32	-	Sari-sari store	480.00	-	-	-
	Poblacion SN Coop. Inc.	June 24, 1976	Dorm.	-	53	None	480.00	-	-	-
Jiabong	Jiabong Fishermen Fee-Coop.	Jan. 14, 1974	Dorm.	-	25	Marketing of fish	375.00	-	-	-
	Malahago SN Coop. Inc.	Mar. 7, 1974	Dorm.	-	37	None	465.00	-	-	-
	Camanibo-an SN Coop. Inc.	Apr. 4, 1974	Dorm.	-	51	None	465.00	-	-	-
	San Fernando SN Coop. Inc.	July 22, 1974	Dorm.	-	26	None	390.00	-	-	-
	Dongongan SN Coop. Inc.	July 27, 1974	Dorm.	-	25	None	375.00	-	-	-
	Jia-an SN Coop. Inc.	July 30, 1974	Dorm.	-	43	None	645.00	-	-	-
	Ulayan SN Coop. Inc.	July 30, 1974	Dorm.	-	25	None	375.00	-	-	-
	Parina SN Coop. Inc.	July 30, 1974	Dorm.	-	34	None	510.00	-	-	-
	Canlaogtong SN Coop. Inc.	Apr. 11, 1975	Active	29	-	Supply of Consumer-goods	1,250.00	-	-	-
	Victory SN Coop. Inc.	Aug. 12, 1976	Dorm.	-	25	None	375.00	-	-	-
	Candajao SN Coop. Inc.	Aug. 12, 1976	Dorm.	-	25	None	375.00	-	-	-
	Crietina SN Coop. Inc.	Aug. 12, 1976	Dorm.	-	25	None	375.00	-	-	-
	Haling SN Coop. Inc.	Aug. 12, 1976	Dorm.	-	25	None	375.00	-	-	-
	Jidanan SN Coop. Inc.	Aug. 12, 1976	Dorm.	-	25	None	375.00	-	-	-
	Tulugayon SN Coop. Inc.	Aug. 12, 1976	Dorm.	-	25	None	375.00	-	-	-
	Hacabotas SN Coop. Inc.	Aug. 20, 1976	Dorm.	-	26	None	390.00	-	-	-
	Catalina SN Coop. Inc.	Aug. 20, 1976	Dorm.	-	26	None	390.00	-	-	-
	Casapa SN Coop. Inc.	Aug. 20, 1976	Dorm.	-	28	None	420.00	-	-	-
	Garcia SN Coop. Inc.	Aug. 20, 1976	Dorm.	-	26	None	390.00	-	-	-
Matieng	Poblacion SN Coop. Inc.	June 28, 1974	Dorm.	-	30	None	450.00	-	-	-
	Calapi SN Coop. Inc.	June 17, 1974	Active	35	-	Supply of Consumer-goods	525.00	-	-	-
	Bonga SN Coop. Inc.	Apr. 19, 1974	Dorm.	-	30	None	450.00	-	-	-
	Caranas SN Coop. Inc.	Apr. 29, 1974	Dorm.	-	28	None	420.00	-	-	-
	Canlayawan SN Coop. Inc.	Apr. 29, 1974	Dorm.	-	29	None	435.00	-	-	-
	New Minoro SN Coop. Inc.	June 28, 1974	Dorm.	-	30	None	450.00	-	-	-
	Oyandic SN Coop. Inc.	Sept.10, 1974	Dorm.	-	28	None	420.00	-	-	-
	Bayog SN Coop. Inc.	Oct. 28, 1974	Dorm.	-	25	None	375.00	-	-	-
	Canlaayan SN Coop. Inc.	June 26, 1974	Dorm.	-	28	None	420.00	-	-	-
	Maloney SN Coop. Inc.	Aug. 12, 1974	Dorm.	-	30	None	450.00	-	-	-
	Nayanas SN Coop. Inc.	Nov. 26, 1974	Dorm.	-	25	None	375.00	-	-	-
	Apayao SN Coop. Inc.	Jan. 15, 1975	Dorm.	-	25	None	375.00	-	-	-
	Hakahago SN Coop. Inc.	July 7, 1976	Dorm.	-	25	None	375.00	-	-	-
San Sebastian	Balogo SN Coop. Inc.	Dec. 23, 1974	Dorm.	-	30	None	450.00	-	-	-
Sta. Rita	Hinagpuldan SN Coop. Inc.	Mar. 7, 1974	Dorm.	-	25	None	375.00	-	-	-
	Pinanaban SN Coop. Inc.	Mar. 7, 1974	Active	27	-	Sari-sari store	555.00	-	-	-
	San Isidro SN Coop. Inc.	May 28, 1974	Active	76	-	Sari-sari store	1140.00	-	-	-
	Nabuhay SN Coop. Inc.	June 24, 1974	Active	52	-	Sari-sari store	780.00	-	-	-
	Bagacay SN Coop. Inc.	May 28, 1974	Dorm.	-	27	None	405.00	-	-	-
	Tuiny SN Coop. Inc.	June 24, 1974	Dorm.	-	48	None	735.00	-	-	-
	San Pascual SN Coop. Inc.	June 24, 1974	Dorm.	-	50	None	750.00	-	-	-
	Tumanawas SN Coop. Inc.	June 24, 1974	Dorm.	-	44	None	660.00	-	-	-
	Catabaltan-an SN Coop. Inc.	June 24, 1974	Dorm.	-	39	None	585.00	-	-	-

Municipality	Name of Samahang Nayon	Yr. Organized	Active/ Dormant	Number of Membership		Nature of Activity	Capital Formation Paid up Capital	Production Loan		
				Active	In-Active			Amount Provided	Amount Recovered	Recovery Rate
- Cont.										
Sta. Rita	New Manunca SN Coop. Inc.	July 17, 1974	Dorm.	-	41	None	₱615.00	-	-	-
	Bagolibas SN Coop. Inc.	July 17, 1974	Dorm.	-	50	None	750.00	-	-	-
	Old Manunca SN Coop. Inc.	July 17, 1974	Dorm.	-	32	None	420.00	-	-	-
	Camayse SN Coop. Inc.	Aug. 26, 1974	Dorm.	-	41	None	615.00	-	-	-
	San Juan SN Coop. Inc.	Aug. 26, 1974	Dorm.	-	25	None	375.00	-	-	-
	San Pedro SN Coop. Inc.	Aug. 26, 1974	Dorm.	-	26	None	390.00	-	-	-
	Anibongon SN Coop. Inc.	Sept.16, 1974	Active	43	-	Grain retailer	645.00	-	-	-
	Sta. Elena SN Coop. Inc.	Sept.15, 1974	Active	78	-	Sari-sari store	1,170.00	-	-	-
	Aslum SN Coop. Inc.	Oct. 15, 1974	Dorm.	-	59	None	885.00	-	-	-
	San Eduardo SN Coop. Inc.	Nov. 26, 1974	Dorm.	-	34	None	510.00	-	-	-
	Aliegria SN Coop. Inc.	Nov. 15, 1974	Dorm.	-	32	None	480.00	-	-	-
	Cabunga-an SN Coop. Inc.	Nov. 13, 1974	Dorm.	-	30	None	450.00	-	-	-
	Sta. Rita Pob. SN Coop. Inc.	Nov. 26, 1975	Dorm.	-	75	None	1,125.00	-	-	-
	Cankandong SN Coop. Inc.	Jan. 15, 1975	Dorm.	-	29	None	435.00	-	-	-
	Dampigan SN Coop. Inc..	Mar. 22, 1975	Active	55	-	None	825.00	-	-	-
	Cabacungan SN Coop. Inc.	Mar. 22, 1975	Dorm.	-	36	None	540.00	-	-	-
	Magsaysay SN Coop. Inc.	Mar. 17, 1976	Dorm.	-	25	None	375.00	-	-	-
	Pagsulhogon SN Coop. Inc.	May 26, 1976	Dorm.	-	27	None	405.00	-	-	-
Basey	San Antonio SN Coop. Inc.	Feb. 15, 1974	Dorm.	-	73	None	1,095.00	-	-	-
	Serum SN Coop. Inc.	Feb. 15, 1974	Dorm.	-	32	None	480.00	-	-	-
	Burgos SN Coop. Inc.	Mar. 7, 1974	Dorm.	-	56	None	40.00	-	-	-
	Lo-oc SN Coop. Inc.	May 16, 1974	Dorm.	-	46	None	690.00	-	-	-
	Rojas SN Coop. Inc.	Jan. 15, 1975	Dorm.	-	30	None	450.00	-	-	-
	Aguimit SN Coop. Inc.	May 20, 1975	Dorm.	-	32	None	480.00	-	-	-
	Villa Aurora SN Coop. Inc.	May 20, 1975	Active	74	-	Sari-sari store	1,110.00	-	-	-
	Buenavista SN Coop. Inc.	Aug. 22, 1975	Dorm.	-	24	None	360.00	-	-	-
Calbiga	Canticum SN Coop. Inc.	May 20, 1974	Active	30	-	Supply of Consumer-goods	450.00	-	-	-
	Tinago SN Coop. Inc.	June 6, 1974	Dorm.	-	30	None	450.00	-	-	-
	Calingonan SN Coop. Inc.	June 6, 1974	Dorm.	-	28	None	420.00	-	-	-
	Malabol SN Coop. Inc.	July 18, 1974	Dorm.	-	27	None	405.00	-	-	-
	Pasiguy SN Coop. Inc.	Aug. 30, 1974	Dorm.	-	28	None	420.00	-	-	-
	Sarobaybay SN Coop. Inc.	Oct. 28, 1974	Dorm.	-	25	None	375.00	-	-	-
	Timbangan SN Coop. Inc.	Oct. 28, 1974	Dorm.	-	25	None	375.00	-	-	-
	Macasian SN Coop. Inc.	Jan. 31, 1975	Dorm.	-	26	None	390.00	-	-	-
	San Ignacio SN Coop. Inc.	July 30, 1975	Dorm.	-	27	None	405.00	-	-	-
	Bacuyaran SN Coop. Inc.	Aug. 8, 1974	Dorm.	-	25	None	375.00	-	-	-
	Calbiga Mesipipg SN Coop. Inc.	Mar. 1, 1977	Dorm.	-	46	None	690.00	-	-	-
Pinabacdao	Botoc SN Coop. Inc.	Mar. 7, 1974	Active	26	-	Supply of Consumer-goods	1,250.00	-	-	-
	Obayan SN Coop. Inc.	Mar. 7, 1974	Active	50	-	Supply of Consumer-goods	1,500.00	-	-	-
	Mambog SN Coop. Inc.	Mar. 7, 1974	Dorm.	-	35	None	525.00	-	-	-
	Denogdog SN Coop. Inc.	Mar. 7, 1974	Dorm.	-	44	None	660.00	-	-	-
	Pahug SN Coop. Inc.	May 27, 1974	Dorm.	-	31	None	465.00	-	-	-
	Catiawan SN Coop. Inc.	May 27, 1974	Dorm.	-	43	None	645.00	-	-	-
	Bangon SN Coop. Inc.	June 5, 1974	Dorm.	-	32	None	480.00	-	-	-
	Liwa-an SN Coop. Inc.	June 17, 1974	Dorm.	-	37	None	555.00	-	-	-
	Loctob SN Coop. Inc.	June 17, 1974	Dorm.	-	27	None	405.00	-	-	-
	San Isidro SN Coop. Inc.	June 17, 1974	Dorm.	-	27	None	405.00	-	-	-
	Laygayon SN Coop. Inc.	June 17, 1974	Dorm.	-	41	None	615.00	-	-	-
	Dolores SN Coop. Inc.	July 8, 1974	Active	55	-	Supply of Consumer-goods	2,025.00	-	-	-
	Paresanon SN Coop. Inc.	July 8, 1974	Dorm.	-	49	None	735.00	-	-	-
Villareal	Mahayag SN Coop. Inc.	Mar. 21, 1974	Dorm.	-	30	None	450.00	-	-	-
	Sto. Niño SN Coop. Inc.	June 11, 1974	Dorm.	-	27	None	405.00	-	-	-
	Ulayan SN Coop. Inc.	June 27, 1974	Dorm.	-	28	None	420.00	-	-	-
	Igot SN Coop. Inc.	June 28, 1974	Dorm.	-	52	None	780.00	-	-	-
	Cambaguio SN Coop. Inc.	June 28, 1974	Dorm.	-	25	None	375.00	-	-	-
	San Rafael SN Coop. Inc.	June 28, 1974	Dorm.	-	25	None	375.00	-	-	-
	Hacopa SN Coop. Inc.	June 28, 1974	Dorm.	-	29	None	435.00	-	-	-
	Guintarcan SN Coop. Inc.	June 17, 1977	Dorm.	-	40	None	600.00	-	-	-
	Pacao SN Coop. Inc.	Apr. 30, 1975	Dorm.	-	28	None	420.00	-	-	-

Table L.2.1. Non-Coop. Farmers' Organizations by Municipality
(As of End of August, 1987)

Municipality	Farmers Association				Rural Improvement Club		4-H Club	
	Active		Dormant		Active		Active	
	Number	Membership	Number	Membership	Number	Membership	Number	Membership
1. Almagro	-	-	-	-	-	-	-	-
2. Basey	2	6	-	-	3	75	-	-
3. Calbayog City	1	30	-	-	4	110	-	-
4. Calbiga	2	46	6	159	4	135	5	100
5. Catbalogan	-	-	-	-	11	354	13	260
6. Daram	-	-	2	59	5	200	-	-
7. Gandara	1	21	2	59	8	179	5	100
8. Hinabangan	-	-	-	-	5	171	-	-
9. Jiabong	-	-	2	60	5	136	-	-
10. Marabut	-	-	1	29	5	201	-	-
11. Matuguinao	-	-	-	-	-	-	-	-
12. Motiong	-	-	1	25	8	217	-	-
13. Pagsanghan	-	-	-	-	-	-	-	-
14. Pinabacdao	2	58	1	13	5	168	-	-
15. San Jorge	2	51	3	54	3	82	5	100
16. San Jose de Buan	-	-	-	-	-	-	-	-
17. San Sebastian	-	-	-	-	-	-	-	-
18. Santa Margarita	3	90	3	54	5	130	5	100
19. Sta. Rita	5	162	2	62	4	116	5	100
20. Sto. Niño	-	-	-	-	-	-	-	-
21. Tagapul-an	-	-	-	-	-	-	-	-
22. Talalora	-	-	-	-	-	-	-	-
23. Tarangnan	3	110	1	62	7	238	4	80
24. Villareal	2	36	-	-	4	91	-	-
25. Wright	2	50	3	99	5	136	5	100
26. Zumarraga	1	15	-	-	5	129	-	-
Total	24	730	26	741	96	2,868	52	940

Source: Department of Agriculture,
Catbalogan, Samar

Table L.2.2. Irrigation Associations in Samar Province
(As of End September, 1987)

Municipality	Barangay	Command Area (ha)	Membership
1. Basey	Loog	65	36
2. Calbayog	Danao	125	42
3. Jiabong	Camaruboan	120	49
4. Marabut	Tagalag	45	22
5. Motiong	Calapi	270	42
6. Pinabacdao	Mambog	20	32
7. San Jorge	La Paz	180	102
8. Sta. Margarita	Panaruan	75	25
9. Sta. Rita	Pagsolhogon	74	23
10. Wright	Tabucan	70	38
11. Wright	Tutubigan	110	60
Total		1,154	471

Source: NIA, Catbalogan, Western Samar

Table L.2.3. Agrarian Reform Beneficiaries Associations in Samar Island (As of End August, 1987)

Team Office		Municipality	Barangay	Membership	TFAO*
Borongan	(East)	10	119	2,821	1
Oras	(East)	5	74	1,264	1
Catarman	(North)	13	107	1,598	1
Lao-ang	(North)	6	106	1,785	1
Catbalogan	(West)	6	110	2,714	1
Calbina	(West)	7	89	1,717	1
Calbayog	(West)	8	177	3,308	1
Total		55	782	15,207	7

Note : *TFAO = Team Farmers' Affairs Officer i/c of ARBA projects.

Source: Department of Agrarian Reforms, Catbalogan, Western Samar.

Fig. L.3.1. Agricultural Supporting Services thru. Coop. System

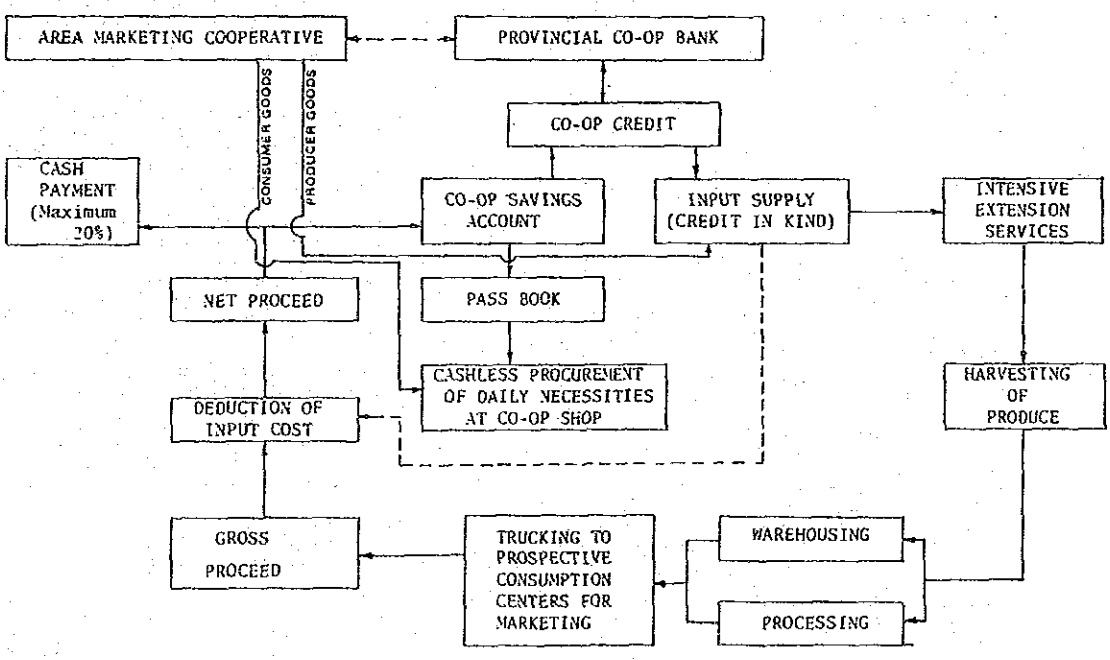
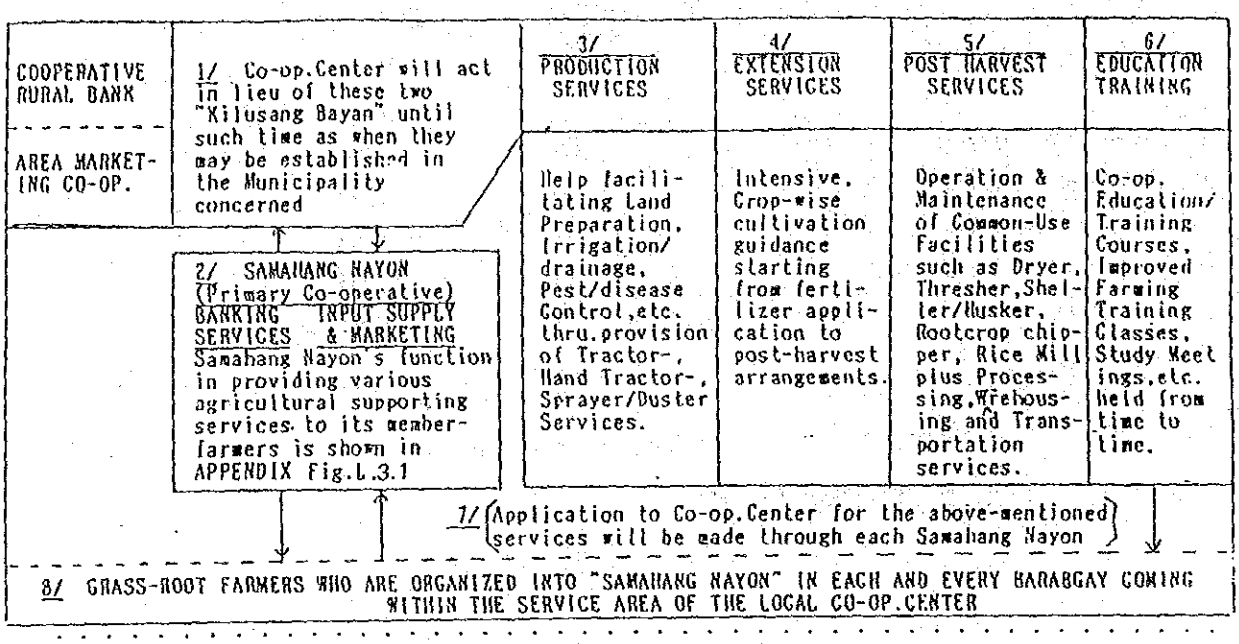


Figure L.3.2. Model Cooperative Center



Remarks: 1/ Since the Primary Multi-purpose Agricultural Cooperative Society shall be organized on Barangay-basis, the Cooperative Rural Bank (CRB) as well as the Area Marketing Cooperative (AMC) will have to be established in each Municipality concerned; at the Provincial level, the municipality based CRBs and AMCs may as well be affiliated to the Provincial "Katipunan" purported for either credit or purchasing/marketing activities. Up until such time as when CRB and AMC may be established in the Municipality concerned, the local Cooperative Center will act in lieu of them in respective field of cooperative banking and inputs supply/marketing activities.

2/ Primary Agricultural Cooperative ("Samahang Nayon") organizing the small farmers in each barangay is not in a position to amass a substantial paid-up capital nor sizeable working fund to carry on input supply/product marketing operations from the very beginning. Its officers and employees are seldomly equipped with enough managerial skill or knowledge. In the initial stage, therefore, "Samahang Nayon" will need to be carefully guided and closely supervised by the local Cooperative Center until it may become mature enough to function as an independent "multi-purpose cooperative". In the meanwhile, it can offer its member-farmers the "input supply" services in terms of provision of "credit-in-kind", so that their material cost may be recovered (with due interest) after harvest upon completion of the products' marketing, there upon inducing the member-farmers to deposit in his cooperative savings account as much money as possible out of his net proceeds. The remaining services such as Extension, Post harvesting and Marketing etc. will be offered by the local Cooperative Center. The agricultural input materials to be supplied to its member-farmers in terms of "credit-in-kind" would also be provided by the Cooperative Center which functions as both CRB and AMC. The internal function of "Samahang Nayon" is illustrated in APPENDIX Figure L.3.1.

3/ Tractors, Hand-tractors, Sprayers (both knap-sack/power), Dusters and other machinery, tools, and implements required for speedy land preparation and timely plant protection etc. are kept for ready use in the Cooperative Center to help Samahang Nayon members' cultivation work, upon receipt of their application thru. their own Samahang Nayon. The minimum rental or hirage fee will be collected from the beneficiaries after harvest.

4/ Extension services towards the cooperative members who attend at agricultural production under the "Supervised Credit" System are vital elements for the ultimate success of the Project itself. Therefore, we must try to replenish whatever technical knowhow the Government Extension Workers may fail to teach.

5/ Cooperative Center is equipped with such Common-Use facilities for Post-harvest operation such as Dryer, Thresher, Rice mill, Sheller, Husker, Rootcrop chipper, as well as Processing, Warehousing and Transporting conveniences to offer to the member-farmers of "Samahang Nayon" which may be affiliated to it.

6/ Development of Cooperative Movement desperately depends on the well-arranged managerial training courses towards cooperative officers and employees. The Cooperative Center will also arrange for dissemination of the improved farming techniques among the member-farmers through appropriate ways and means, from time to time.

7/ Application for various co-operative services by the Cooperative Center must be made through "Samahang Nayon"; no individual application will be answered.

8/ Cooperative Center is meant for strengthening of the barangay "Samahang Nayon" through which it is determined to work in every possible way to promote the socio-economic development of the grass-root farmers.

GROUP WORK - VOLUNTARY & COMMUNAL - IN BARRIOS

There are a number of voluntary organizations for carrying out economic purposes, building houses, plowing fields, transplanting rice, for harvesting, and for community projects of one sort or another. It is interesting to see how these are organized in a community, particularly how they are brought together, what keeps them together, and occasionally how they get rid of persons who do not quite fit in.

1) Work-Exchange Groups

Apart from aggregations of kinsmen or relatives who very frequently cooperate in a number of economic tasks of one sort or another in a barrio, the economics of getting things done sometimes makes it important to execute them as a cooperative work by including neighbors as well as relatives. Besides cooperative work, there are a number of specializations in work activities, for instance, work exchange groups. This is comprised of five to ten individuals who agree to work cooperatively in rotation on each person's field. These groups are characteristically organized around a leader who acts as a foreman and sees that everyone is working at good pace; the unit is one day's work. They go around in this way and cultivate a series of five or ten fields. If someone supplies a carabao he gets credit for two man-days because a carabao is thought to be roughly equivalent in work to one man. Time is carefully counted and a series of fines assures that if one does not get there on time, he has to work extra or pay a fine. Here work is based on even shares and everyone is doing the same thing and doing it cooperatively.

There is another kind of work group which is called on for particular occasions, for example: someone wanting to build a house, repair it, or move it somewhere, or help is being required in sowing a field. One may go around telling friends and neighbors there is going to be a "work bee" (this kind of group-work may be called differently from barrio to barrio). In this activity the work contribution is voluntary. Neighbors, friends, and relatives will come, some bringing with them bamboo and thatching if a house is being repaired. Interestingly enough, these operations go on without apparent leadership or organization. They have done it so long that they know what to expect, what to do, and they do it relatively efficiently. Sometime in the afternoon the person who has asked for this has to furnish a large feast. In many areas the feast is more important than the money they would get if they came to work for wages. In the "work bee" you have reciprocal relations and obligations that are largely limited in repayment to participating in other "work bees".

2) Community Work

There is another kind of work on a community-wide basis and that is free labor for community purposes. Within the community free labor is expected for the fiesta, for repair of barrio chapel, for repair of the school, or for repair of bridges, but in many barrios not for the repair of roads, saying that is the job of the municipality or the job of the central government (it is supposedly due to a historical fact that during the Spanish period most of the free work was done on roads under rather difficult conditions). In addition, there are other group activities or rather the mutual financing groups functioning through a "lottery" arrangement. Individuals (often, 30 or 40) who have small incomes may pool their incomes each putting in 50 centavos or a peso a week; each week there will be a drawing and one person will get the whole amount. He will then be excluded from the drawings, though he continues to participate, until all have had their turn.

L.4. Encouragements to Rural Workers Development Project

Rural Workers Development Project vigorously promoted by the Workers Amelioration & Welfare Division (WAWD), Department of Labor & Employment (DOLE) in TACLOBAN, representing and working on behalf of the Bureau of Rural Workers (BRW) in the Eastern Visayas Region, owes its original inception to the "International Labor Organization (ILO) Recommendation 149" which was adopted in this international organization's Convention 141 on 04/06/75, reading among others: "... it shall be an objective of national policy concerning rural development to facilitate the establishment and growth, on a voluntary basis, of strong and independent organization of rural workers as an effective means of participation of rural workers in economic and social development and in the benefits resulting therefrom". Ratification of the same by the Philippines came through PD 1852 and, accordingly, an unnumbered Presidential Decree authorized a creation of the Rural Workers Office in DOLE on 16/12/75. This Office's initial task was the institutionalisation and operationalization of the Social Amelioration Program for the sugar industry workers. Presidential Decree No. 1365 dated 01/05/78 broadened and strengthened the thrust, functions and structures of the Rural Workers Office by confirming the legitimacy of this Office as an operating agency of the government that promotes self-development among the rural poor, marginal farmers, fishermen, landless and even itinerant and unassimilated workers in towns and cities.

In March 1982, the status of the Office was further elevated by virtue of LOI 1209 to that of a Bureau of Rural Workers (BRW) under the operational supervision of DOLE. LOI 1209 empowered BRW to register the rural workers organizations and also to grant loans to them to set up livelihood projects aimed at their income supplementation. And, coinciding with the expansion of BRW's programs and services, the "Integrated Approach to Rural Workers Development" was adopted in view of attuning its operation more effectively toward fulfillment of its task that is "to protect, uplift and promote the welfare of rural workers in order that they can participate more meaningfully and in due-recognition of their capability to contribute to the task of national development and nation-building".

The "Integrated Approach" is firmly supported by four pillars of: (i) Rural Research Program; (ii) Rural Education & Organization Program; (iii) Rural Projects Development Program, and (iv) Social Amelioration Program. A brief introduction to WAWD's performance since 1979 will be mad Program-wise, as follows:

(i) Rural Research Program

This Program has since been pursued in order to chalk out guide-lines for conducting the other three Programs so that they may directly address the basic needs of the rural poor. This has been made through analysis of the structures and institutions that promote or hinder their growth.

(ii) Rural Education & Organization Program

The rural workers have had to be organized for their own socio-economic development through self-reliance. The approach has been commenced by "registering" their group which lacked clear and definite employer-employee relationship to grant them legal personality eligible for loans with low interest to start the income-supplementing livelihood projects. Thus, 79 RWOs composed of some 2,700 members have so far been registered. The professional background of the members of the registered RWOs is very much diversified: sugar workers, fishermen, coconut farmers, rice farmers, agricultural wage-earners, stevedores, deep-well drillers, rattan cane cutters, drivers, etc. As for education, 24 seminars and workshops covering 682 participants have been conducted so far.

APPENDIX M. COST ESTIMATE

APPENDIX M. COST ESTIMATE

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M.1. Development Cost

The development cost is composed of 12 item costs according to the sectoral development program as follows;

1. Agricultural development
2. Small scale and cottage industry development
3. Infrastructure development
    1) Irrigation and drainage development
    2) Roads and transportation development
    3) Mini-hydro power development
    4) Rural electrification development
    5) Rural water supply development
4. Social services development
    1) Health services development
    2) Education development
    3) Housing development
    4) Communication development
5. Agricultural Development and Promotion Project (ADPP)

The project cost is shown in Table M.1 and its break down is in Table M.2 and M.3.

M.2. Investment Schedule

The investment schedule is estimated at current price on the basis of priority of the development program. The estimated investment schedule of the project cost by phase is shown in Table M.4.

M.3. Operation and Maintenance Cost

The annual operation and maintenance cost is estimated at current price by project and by the development stage. The annual operation and maintenance cost is as shown in Table M.5 and its details are in Table M.6.

Table M.1 Summary of Project Cost at Current Price

(unit: 1,000 ₱)

Description	F.C.	L.C.	Total
1. Agricultural Development	38,500	61,500	100,000
2. Small Scale & Cottage Industry Development	8,900	11,400	20,300
3. Infrastructure Development			
1) Irrigation and Drainage	779,250	759,950	1,539,200
2) Roads and Transportation	1,353,150	907,250	2,260,400
3) Mini-Hydro Power	312,550	247,800	560,350
4) Rural Electrification	426,370	298,830	725,200
5) Rural Water Supply	385,775	439,625	825,400
Sub-Total of 3	3,257,095	2,653,455	5,910,550
4. Social Services Development			
1) Health Services	211,230	331,570	542,800
2) Education	64,875	202,625	267,500
3) Housing	-	897,500	897,500
4) Communication	54,000	94,500	148,500
Sub-Total of 4	330,105	1,526,195	1,856,300
5. ADPP	372,400	190,450	562,850
Total (1 - 5)	4,007,000	4,443,000	8,450,000

Table M.2 Break Down of Project Cost for Irrigation and Drainage Development (1/3)

(unit: 1,000 ₱)

	Description	Irrigable Area (ha)	Irri. Facility	On-Farm Facility	Drain. Facility	SWIMP/ Tidal Gate	Total Amount F.C.	L.C.	Total
1) CIS, CIP Rehabilitation Project									
C1	Danao	110	1,760	440	-	-	1,012	1,188	2,200
C10	Panaruan	60	4,800	240	3,300	18,250	15,072	11,518	26,590
C3	Camaroboan	100	1,600	400	-	-	920	1,080	2,000
C13	Hinikaan	20	320	80	-	-	184	216	400
C2	Calapi	230	3,680	920	-	-	2,116	2,484	4,600
C27	Casandig-Lawaan	90	1,980	360	-	-	1,098	1,242	2,340
C30	Tutubigan	100	1,600	400	-	-	920	1,080	2,000
C9	Tabucan	60	960	240	-	-	552	648	1,200
C29	Apolonia	20	320	80	-	-	184	216	400
C5	Mambog-Tadcan	40	880	160	-	-	488	552	1,040
C7	Lantagan	50	1,100	200	-	-	610	690	1,300
C8	Placer	20	320	80	-	-	184	216	400
C4	Sn Andres	50	850	200	-	-	485	565	1,050
C28	Hilaba	20	320	80	-	-	184	216	400
C6	Tagalog	40	640	160	-	-	368	432	800
C24	Basyao	20	320	80	-	-	184	216	400
C23	Sulpan	30	2,160	120	1,650	-	1,941	1,989	3,930
C22	Lo-og	30	2,190	120	1,650	-	1,956	2,004	3,960
C21	Basey	20	1,440	80	1,100	-	1,294	1,326	2,620
C11	Sn Antonio	20	1,440	80	1,100	-	1,294	1,326	2,620
P1	Napuro	20	1,520	80	1,100	18,250	12,284	8,666	20,950
P17	Casandik-T	70	5,320	280	3,850	-	4,669	4,781	9,450
P3	Casandik-P	40	2,960	160	2,200	-	2,628	2,692	5,320
P11	Bangahon	30	2,160	120	1,650	-	1,941	1,989	3,930
P18	Calirocan	50	3,700	200	2,750	-	3,285	3,365	6,650
P10	Sn Pelayo	100	7,200	400	5,500	-	6,470	6,630	13,100
P9	Elenas	20	1,440	80	1,100	-	1,294	1,326	2,620
P14	Bulao-T	120	10,680	480	6,600	-	8,784	8,976	17,760
P19	Sn Miguel	50	3,600	200	2,750	-	3,235	3,315	6,550
P12	Parina	30	660	120	-	-	366	414	780
P8	Lapaz-P	60	4,320	240	3,300	-	3,882	3,978	7,860
P4	Bangon	30	2,160	120	1,650	-	1,941	1,989	3,930
P5	Mambog	20	1,440	80	1,100	-	1,294	1,326	2,620
	Sub-Total	1,770	75,840	7,080	42,350	36,500	83,119	78,651	161,770

(Cont'd)

Table M.2 Break Down of Project Cost for Irrigation and Drainage Development (2/3)

(unit: 1,000 ₱)

Description	Irrigable Area (ha)	Irri. Facility	On-Farm Facility	Drain. Facility	SWIMP/ Tidal Gate	Total Amount F.C.	Total Amount L.C.	Total Amount Total
2) CIS New Project								
1 Bayo	230	16,560	1,610	12,650	-	15,088	15,732	30,820
2 Pilar	270	21,060	1,890	14,850	-	18,522	19,278	37,800
3 Sigo	100	7,200	700	5,500	-	6,560	6,840	13,400
4 Ton-ok	260	26,260	1,820	14,300	-	20,826	21,554	42,380
5 Tabokno	80	6,240	560	4,400	-	5,488	5,712	11,200
6 Nabang	20	1,520	140	1,100	-	1,352	1,408	2,760
7 Alang-Alang	20	1,680	140	1,100	-	1,432	1,488	2,920
8 Sn Joaquin	20	1,440	140	1,100	-	1,312	1,368	2,680
9 Canipulan	20	1,480	140	1,100	-	1,332	1,388	2,720
10 Naga	100	7,800	700	5,500	13,000	14,660	12,340	27,000
11 Carayman	60	4,320	420	3,300	13,000	11,736	9,304	21,040
12 Obrero	60	4,800	420	3,300	13,000	11,976	9,544	21,520
13 Maglawawaan	30	2,220	210	1,650	13,000	9,798	7,282	17,080
14 Navarro	120	11,160	840	6,600	-	9,132	9,468	18,600
15 Gavoy	130	13,000	910	7,150	-	10,348	10,712	21,060
16 Sinantan	90	8,190	630	4,950	-	6,759	7,011	13,770
17 Ayolito	170	14,620	1,190	9,350	-	12,342	12,818	25,160
18 Rawis	380	27,360	2,660	20,900	-	24,928	25,992	50,920
19 Penaplata	100	8,400	700	5,500	-	7,160	7,440	14,600
20 Pizaro	100	7,300	700	5,500	-	6,610	6,890	13,500
21 Sto Nino	280	20,440	1,960	15,400	-	18,508	19,292	37,800
22 Giras	40	2,880	280	2,200	-	2,624	2,736	5,360
23 Pologon	110	10,120	770	6,050	-	8,316	8,624	16,940
24 Sapinit	160	18,560	1,120	8,800	-	14,016	14,464	28,480
25 Naghituiman	210	22,680	1,470	11,550	-	17,556	18,144	35,700
26 Janipon	160	19,520	1,120	8,800	-	14,496	14,944	29,440
27 Barayong	260	7,280	1,820	-	13,000	11,986	10,114	22,100
28 Sta Rosa	30	2,310	210	1,650	13,000	9,843	7,327	17,170
29 Binoongan	70	5,390	490	3,850	13,000	12,567	10,163	22,730
30 Sta Rita	370	27,380	2,590	20,350	13,000	32,442	30,878	63,320
31 Silaga	450	11,700	3,150	-	-	6,795	8,055	14,850
32 Tagaca	90	6,930	630	4,950	13,000	13,929	11,581	25,510
33 Catabonan	90	2,340	630	-	-	1,359	1,611	2,970
34 Hinangutdan	50	3,650	350	2,750	13,000	11,105	8,645	19,750
35 Bagolis	140	11,760	980	7,700	-	10,024	10,416	20,440
36 Sta Elena	160	11,840	1,120	8,800	13,000	18,456	16,304	34,760
37 Damoigan	180	12,960	1,260	9,900	13,000	19,608	17,512	37,120
38 Canmada	480	35,520	3,360	26,400	13,000	39,768	38,512	78,280
39 Dolongan	340	27,200	2,380	18,700	13,000	31,464	29,816	61,280
40 Cantaba	260	20,280	1,820	14,300	13,000	25,636	23,764	49,400
41 Basey	1,340	97,820	9,380	73,700	13,000	96,374	97,526	193,900
42 Inumtan	50	3,800	350	2,750	-	3,380	3,520	6,900

(Cont'd)

Table M.2 Break Down of Project Cost for Irrigation and Drainage Development (3/3)

(unit: 1,000 ₱)

	Description	Irrigable Area (ha)	Irri. Facility	On-Farm Facility	Drain. Facility	SWIMP/ Tidal Gate	Total Amount F.C.	L.C.	Total
43	Lo-og	340	8,500	2,380	-	-	4,964	5,916	10,880
44	Independence	40	640	280	-	-	404	516	920
45	Karanas	60	4,320	420	3,300	-	3,936	4,104	8,040
46	Inungayan	70	5,040	490	3,850	-	4,592	4,788	9,380
47	Kalayaan-Patong	600	43,200	4,200	33,000	-	39,360	41,040	80,400
48	Lawaan	70	5,040	490	3,850	-	4,592	4,788	9,380
49	Concepcion	30	2,160	210	1,650	-	1,968	2,052	4,020
50	Casandig	170	12,240	1,190	9,350	-	11,152	11,628	22,780
51	Camsotabao	500	13,000	3,500	-	-	7,550	8,950	16,500
	Sub-Total	9,560	669,110	66,920	433,400	208,000	696,131	681,299	1,377,430
	T o t a l	11,330	744,950	74,000	475,750	244,500	779,250	759,950	1,539,200

Table M.3 Break Down of Project Cost (1/6)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Amount F.C.	Amount L.C.	Amount Total	Remark
Agricultural Development						
1) Irrigated Rice/Deversified Crops Cultivation	site	2	750	750	1,500	
2) Rainfed Rice/Diversified Crops Cultivation	"	2	-	500	500	
3) Post-Harvest Facilities	"	3	1,500	1,500	3,000	
4) Rice Mill	"	3	750	3,000	3,750	
5) Development of Corn Cultivation	"	1	1,600	600	2,200	
6) Development of Contour/Hillside Farming	"	17	-	4,250	4,250	
7) Replanting/Planting with Abaca Improved Varieties	"	4	1,440	960	2,400	
8) Introduction of Other Fiber Crops	"	3	-	750	750	
9) Planting with Coconut Improved Varieties	"	19	-	4,750	4,750	
10) Copra Drying & Coconut Shell Charcoal Making	"	2	1,000	1,000	2,000	
11) Pest/Disease Control Laboratory	stn	1	360	1,440	1,800	
12) Coconut Timber Utilization	site	2	-	240	240	
13) Trial/Demonstration of Agro-Forestry	"	11	-	2,750	2,750	
14) Carabao Dispersal	unit	1	1,100	2,900	4,000	
15) Swine Artificial Breeding Center	stn	2	1,700	1,900	3,600	
16) Swine Breeding Center	"	1	-	370	370	
17) Sheep/Goat Production Center	"	4	4,000	6,000	10,000	
18) Sheep/Goat Dispersal	site	6	3,000	-	3,000	
19) Duck Farm for Dispersal	site	1	300	500	800	
20) Egg Farm	"	1	250	-	250	
21) Cattle Raising	"	4	1,000	1,000	2,000	
22) Slaughterhouse	"	21	-	5,250	5,250	
23) Demonstration of Freshwater Fish Culture	"	6	1,800	2,400	4,200	
24) Nursery Pond	"	2	240	1,000	1,240	
25) Market Assistance Center	"	3	2,880	1,920	4,800	
26) Municipal Nursery	"	15	6,000	9,000	15,000	
27) Organization & Management of Farmers Group/Agricultural Cooperatives	"	2	7,750	4,250	12,000	
28) Functional Farmer's Dwelling Development	"	3	1,080	2,520	3,600	
Total			38,500	61,500	100,000	

(Cont'd)

Table M.3 Break Down of Project Cost (2/6)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Amount F.C.	Amount L.C.	Amount Total	Remark
Small Scale and Cottage Industry Development						
1) Coconut Industry	stn	3	3,000	2,250	5,250	
2) Sales Display Center	"	3	1,500	1,950	3,450	
3) Training/Services Center	"	3	3,420	6,330	9,750	
4) Common Service Facility	"	1	430	320	750	
5) Center of Procurement' Storage and Selling Materials	"	1	550	550	1,100	
Total			8,900	11,400	20,300	
Roads and Transportation Development						
1) Road Improvement						
Type A	km	210	315,000	210,000	525,000	
Type B	"	70	37,800	25,200	63,000	
Type C	"	238	85,680	57,120	142,800	
Sub-Total		518	438,480	292,320	730,800	
2) Road New Construction						
Type A	km	50	129,600	86,400	216,000	
Type B	"	80	76,800	51,200	128,000	
Type C	"	653	430,980	287,320	718,300	
Type D	"	144	47,520	31,680	79,200	
Sub-Total		927	684,900	456,600	1,141,500	
3) Bridge Construction						
RCDG	L.M.	3,800	182,400	121,600	304,000	
Non-Composite Beam Girder	"	445	42,720	28,480	71,200	
Sub-Total		4,245	225,120	150,080	375,200	
4) Improvement of Calbayog Airport						
Apron Expansion	m^2	4,000	2,160	5,040	7,200	
Runway Expansion	"	1,000	540	1,260	1,800	
Sub-Total		5,000	2,700	6,300	9,000	
5) Bus Terminal						
Catbalogan Bus Terminal	unit	1	600	600	1,200	
Calbayog Bus Terminal	"	1	600	600	1,200	
Basey Bus Terminal	"	1	375	375	750	
Gandara Bus Terminal	"	1	375	375	750	
Sub-Total		4	1,950	1,950	3,900	
Total			353,150	907,250	2,260,400	
Mini-Hydro Power Development						
1) Bugtong Hydro Power Project						
Equipment	kw	1,800	19,800	-	19,800	
Civil Works	lot	1	12,000	28,000	40,000	
Sub-Total			31,800	28,000	59,800	
2) Tabukno Mini-Hydro Power Project						
Equipment	kw	60	2,700	-	2,700	
Civil Works	lot	1	1,500	3,500	5,000	
Sub-Total			4,200	3,500	7,700	

(Cont'd)

Table M.3 Break Down of Project Cost (3/6)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Amount F.C.	Amount L.C.	Amount Total	Remark
3) Malauog Mini-Hydro Power Project						
Equipment	kw	120	4,920	-	4,920	
Civil Works	lot	1	1,500	3,500	5,000	
Sub-Total			6,420	3,500	9,920	
4) Matuguinao Mini-Hydro Power Project						
Equipment	kw	350	11,200	-	11,200	
Civil Works	lot	1	1,920	4,480	6,400	
Sub-Total			13,120	4,480	17,600	
5) Malapgap Mini-Hydro Power Project						
Equipment	kw	180	6,660	-	6,660	
Civil Works	lot	1	1,590	3,710	5,300	
Sub-Total			8,250	3,710	11,960	
6) Matatud Mini-Hydro Power Project						
Equipment	kw	110	4,510	-	4,510	
Civil Works	lot	1	1,500	3,500	5,000	
Sub-Total			6,010	3,500	9,510	
7) Blanka R. Hydro Power Project						
Equipment	kw	2,500	25,000	-	25,000	
Civil Works	lot	1	18,810	43,890	62,700	
Sub-Total			43,810	43,890	87,700	
8) Aurora F. Mini-Hydro Power Project						
Equipment	kw	30	1,500	-	1,500	
Civil Works	lot	1	1,500	3,500	5,000	
Sub-Total			3,000	3,500	6,500	
9) Tongbong Mini-Hydro Power Project						
Equipment	kw	250	9,000	-	9,000	
Civil Works	lot	1	1,650	3,850	5,500	
Sub-Total			10,650	3,850	14,500	
10) Heruando Mini-Hydro Power Project						
Equipment	kw	400	12,000	-	12,000	
Civil Works	lot	1	1,950	4,550	6,500	
Sub-Total			13,950	4,550	18,500	
11) Tagoyang R. Mini-Hydro Power Project						
Equipment	kw	160	6,240	-	6,240	
Civil Works	lot	1	1,530	3,570	5,100	
Sub-Total			7,770	3,570	11,340	
12) Ulot R. Hydro Power Project						
Equipment	kw	3,800	32,300	-	32,300	
Civil Works	lot	1	28,140	65,660	93,800	
Sub-Total			60,440	65,660	126,100	
13) Calbiga Mini-Hydro Power Project						
Equipment	kw	1,400	19,600	-	19,600	
Civil Works	lot	1	8,250	19,250	27,500	
Sub-Total			27,850	19,250	47,100	
14) Sohotan R. Hydro Power Project						
Equipment	kw	2,700	27,000	-	27,000	
Civil Works	lot	1	20,640	48,160	68,800	
Sub-Total			47,640	48,160	95,800	

(Cont'd)

Table M.3 Break Down of Project Cost (4/6)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Amount F.C.	Amount L.C.	Amount Total	Remark
15) Burgas Mini-Hydro Power Project						
Equipment	kw	400	12,400	-	12,400	
Civil Works	lot	1	2,040	4,760	6,800	
Sub-Total			14,440	4,760	19,200	
16) Ford Mini-Hydro Power Project						
Equipment	kw	360	11,520	-	11,520	
Civil Works	lot	1	1,680	3,920	5,600	
Sub-Total			13,200	3,920	17,120	
Total			312,550	247,800	560,350	
Rural Electrification Development						
1) Transmission Line (138 KVA)	km	120	291,310	194,210	485,520	
2) Distribution Line for Area-1						
Distribution Line (3ϕ)	km	470	56,964	37,976	94,940	
Secondary Line	"	290	9,396	14,094	23,490	
Sub-Total		760	66,360	52,070	118,430	
3) Distribution Line for Area-2						
Distribution Line (3ϕ)	km	500	60,600	40,400	101,000	
Secondary Line	"	250	8,100	12,150	20,250	
Sub-Total		750	68,700	52,550	121,250	
Total			426,370	298,830	725,200	
Rural Water Supply Development						
1) Calbayog Rural Area						
Intake Facility	m^3/d	18,000	990	990	1,980	
Filtration Plant	"	18,000	4,860	11,340	16,200	
Reservoir	m^3	6,200	7,626	17,794	25,420	
Operation House	m^2	400	2,700	2,700	5,400	
Distribution Pipeline	m	60,000	81,000	81,000	162,000	
Sub-Total			97,176	113,824	211,000	
2) Calbiga Rural						
Intake Pump Station	m^3/d	2,000	2,100	2,100	4,200	
Reservoir	m^3	700	861	2,009	2,870	
Distribution Pipeline	m	20,000	16,200	16,200	32,400	
Sub-Total			19,161	20,309	39,470	
3) Basey Rural						
Intake Facility	m^3/d	5,000	275	275	550	
Filtration Plant	"	5,000	1,350	3,150	4,500	
Reservoir	m^3	1,700	2,091	4,879	6,970	
Operation House	m^2	200	1,350	1,350	2,700	
Distribution Pipeline	m	30,000	40,500	40,500	81,000	
Sub-Total			45,566	50,154	95,720	
4) Pinabacdao Deepwell Development						
Deepwell Pump Station	m^3/d	1,400	1,190	1,190	2,380	
Reservoir	m^3	500	615	1,435	2,050	
Distribution Pipeline	m	8,000	6,480	6,480	12,960	
Sub-Total			8,285	9,105	17,390	

(Cont'd)

Table M.3 Break Down of Project Cost (5/6)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Amount F.C.	Amount L.C.	Amount Total	Remark
5) San Sebastian Deepwell Development						
Deepwell Pump Station	m^3/d	700	595	595	1,190	
Reservoir	m^3	300	369	861	1,230	
Distribution Pipeline	m	4,000	3,240	3,240	6,480	
Sub-Total			4,204	4,696	8,900	
6) Pagsanghan Deepwell Development						
Deepwell Pump Station	m^3/d	1,300	1,105	1,105	2,210	
Reservoir	m^3	500	615	1,435	2,050	
Distribution Pipeline	m	8,000	6,480	6,480	12,960	
Sub-Total			8,200	9,020	17,220	
7) Catbalogan Rural Area						
Intake Facility	m^3/d	18,000	990	990	1,980	
Intake Pump Station	"	18,000	18,900	18,900	37,800	
Reservoir (Wright)	m^3	6,000	7,380	17,220	24,600	
Booster Pump Station	m^3/d	15,000	15,750	15,750	31,500	
Reservoir (Catbalogan)	m^3	7,400	9,102	21,238	30,340	
Distribution Pipeline	m	55,000	74,250	74,250	148,500	
Sub-Total			126,372	148,348	274,720	
8) Taranguan Deepwell Development						
Deepwell Pump Station	m^3/d	2,600	2,210	2,210	4,420	
Reservoir	m^3	900	1,040	2,650	3,690	
Distribution Pipeline	m	15,000	12,150	12,150	24,300	
Sub-Total			15,400	17,010	32,410	
9) Santa Rita Deepwell Development						
Deepwell Pump Station	m^3/d	2,400	2,040	2,040	4,080	
Reservoir	m^3	800	984	2,296	3,280	
Distribution Pipeline	m	15,000	12,150	12,150	24,300	
Sub-Total			15,174	16,486	31,660	
10) Talalora Deepwell Development						
Deepwell Pump Station	m^3/d	900	765	765	1,530	
Reservoir	m^3	300	369	861	1,230	
Distribution Pipeline	m	5,000	4,050	4,050	8,100	
Sub-Total			5,184	5,676	10,860	
11) Villareal Deepwell Development						
Deepwell Pump Station	m^3/d	2,900	2,465	2,465	4,930	
Reservoir	m^3	1,000	1,230	2,870	4,100	
Distribution Pipeline	m	17,000	13,770	13,770	27,540	
Sub-Total			17,465	19,105	36,570	
12) Marbut Deepwell Development						
Deepwell Pump Station	m^3/d	2,300	1,955	1,955	3,910	
Reservoir	m^3	800	984	2,296	3,280	
Distribution Pipeline	m	14,000	11,340	11,340	22,680	
Sub-Total			14,279	15,591	29,870	
13) Matuguinao Deepwell Development						
Deepwell Pump Station	m^3/d	500	425	425	850	
Reservoir	m^3	200	252	588	840	
Distribution Pipeline	m	3,100	2,430	2,430	4,860	
Sub-Total			3,107	3,443	6,550	

(Cont'd)

Table M-3 Break Down of Project Cost (6/6)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Amount F.C.	Amount L.C.	Amount Total	Remark
14) San Jose De Buan Deepwell Development						
Deepwell Pump Station	m^3/d	1,000	850	850	1,700	
Reservoir	m^3	400	492	1,148	1,640	
Distribution Pipeline	m	6,000	4,860	4,860	9,720	
Sub-Total			6,202	6,858	13,060	
Total			385,775	439,625	825,400	
Health Services Development						
1) Hospital Bed	bed	870	184,440	276,660	461,100	
2) Brangay Health Station (BHS)	unit	190	22,230	51,870	74,100	
3) Salar Cold Chain	"	16	4,560	3,040	7,600	
Total			211,230	331,570	542,800	
Education Development						
1) Elementary School Building						
New Construction	room	820	49,200	114,800	164,000	
Rehabilitation	"	1,080	-	44,280	44,280	
Sub-Total		1,900	49,200	159,080	208,280	
2) Secondary School Building						
New Construction	room	130	7,800	18,200	26,000	
Rehabilitation	"	170	-	6,970	6,970	
Sub-Total		300	7,800	25,170	32,970	
3) Tertiary School Building						
New Construction (4000 m^3/p)	place	3	7,875	18,375	26,250	
Total			64,875	202,625	267,500	
Housing Development						
1) Rural/Urban Resettlement Program	D.U.	1,300	-	97,500	97,500	
2) Economic and Open Market Housing Program	"	4,000	-	800,000	800,000	
Total			-	897,500	897,500	
Communication Development						
1) Telecommunication Facilities						
◦ Establishment of NTTS Station	stn	28	907.2	2,116.8	3,024	
◦ Establishment of New Telegraph Station	"	4	129.6	302.4	432	
◦ Conversion from Wire Telegraph to HF/CW Radio Station	"	10	405	945	1,350	
◦ Replacement of Old and Defective Radio Equipment	"	14	340.2	793.8	1,134	
◦ Repair of Telecom Building	"	24	972	2,268	3,240	
◦ Reconstruction of Outside Plants & Repair of Inside Plant Facilities for Rural Telephone Exchange	"	1	283.5	661.5	945	
◦ Expansion of Outside Plants Facilities for Rural Telephone Exchange	"	5	3,037.5	7,087.5	10,125	
◦ Establishment of New Telephone stn.	"	4	24,300	56,700	81,000	
Sub-Total			30,375	70,875	101,250	
2) Postal Communication Facilities						
◦ Construction of City Post Office	stn	1	5,400	5,400	10,800	
◦ Construction of Bureau Owned Bldg.	"	26	8,775	8,775	17,550	
◦ Establishment of Postal Station in Rural Area	"	28	9,450	9,450	18,900	
Sub-Total			23,625	23,625	47,250	
Total			54,000	94,500	148,500	

Table M.4 Investment Schedule of Project Cost

(unit: 1,000 ₱)

Description	Short-Term (1988-1992)			Medium-Term (1993-1997)		
	F.C.	L.C.	Total	F.C.	L.C.	Total
1. Agricultural Development	15,910	27,100	43,010	20,980	31,960	52,940
2. Small Scale and Cottage Industry Development	5,620	5,880	11,500	1,640	2,760	4,400
3. Infrastructure Development						
1) Irrigation and Drainage	85,430	85,380	170,810	199,347	198,073	397,420
2) Roads and Transportation	283,260	189,240	472,500	344,490	234,410	578,900
3) Mini-Hydro Power	31,800	28,000	59,800	104,250	109,550	213,800
4) Rural Electrification	65,550	50,855	116,405	41,706	32,259	73,965
5) Rural Water Supply	161,903	184,287	346,190	20,689	22,821	43,510
Sub-Total of 3	627,943	537,762	1,165,705	710,482	597.113	1,307,595
4. Social Services Development						
1) Health Services	56,830	84,370	141,200	40,720	64,980	105,700
2) Education	20,625	60,835	81,460	11,025	51,555	62,580
3) Housing	-	226,250	226,250	-	226,250	226,250
4) Communication	24,791	35,797	60,588	21,649	47,363	69,012
Sub-Total of 4	102,246	407,252	509,498	73,394	390,148	463,542
5. ADPP	372,400	190,450	562,850	-	-	-
Total (1 - 5)	1,124,119	1,168,444	2,292,563	806,496	1,021,981	1,828,477
(say)	(1,124,000)	(1,168,000)	(2,292,000)	(807,000)	(1,022,000)	(1,829,000)

Description	Long-Term (1998-2007)			T o t a l		
	F.C.	L.C.	Total	F.C.	L.C.	Total
1. Agricultural Development	1,610	2,440	4,050	38,500	61,500	100,000
2. Small Scale and Cottage Industry Development	1,640	2,760	4,400	8,900	11,400	20,300
3. Infrastructure Development						
1) Irrigation and Drainage	494,473	476,497	970,970	779,250	759,950	1,539,200
2) Roads and Transportation	725,400	483,600	1,209,000	1,353,150	907,250	2,260,400
3) Mini-Hydro Power	176,500	110,250	286,750	312,550	247,800	560,350
4) Rural Electrification	319,114	215,716	534,830	426,370	298,830	725,200
5) Rural Water Supply	203,183	232,517	435,700	385,775	439,625	825,400
Sub-Total of 3	1,918,670	1,518,580	3,437,250	3,257,095	2,653,455	5,910,550
4. Social Services Development						
1) Health Services	113,680	182,220	295,900	211,230	331,570	542,800
2) Education	33,225	90,235	123,460	64,875	202,625	267,500
3) Housing	-	445,000	445,000	-	897,500	897,500
4) Communication	7,560	11,340	18,900	54,000	94,500	148,500
Sub-Total of 4	154,465	728,795	883,260	330,105	1,526,195	1,856,300
5. ADPP	-	-	-	372,400	190,450	562,850
Total (1 - 5)	2,076,385	2,252,575	4,328,960	4,007,000	4,443,000	8,450,000
(say)	(2,076,000)	(2,253,000)	(4,329,000)			

Table M.5. Summary of Annual Operation and Maintenance Cost

(unit: 1,000 ₱)

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

Table M.6. Break Down of Annual Operation and Maintenance Cost (1/7)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Rate	Amount	Remark
Agricultural Development					
1) Irrigated Rice/Diversified Crops Cultivation	site	2	230	460	S.T.-5Y
2) Rainfed Rice/Diversified Crops Cultivation	"	2	170	340	S.T.-5Y
3) Post-harvest Facilities	"	3	430	1,290	S.T.-5Y
4) Rice Mill	"	3	240	720	M.T.(3)-5Y
5) Development of Corn Caltivation	"	1	310	310	S.T.-5Y
6) Development of Contour/ Hillside Farming	"	17	180	3,060	S.T.(2)-5Y, M.T.(15)-5Y
7) Replanting/Planting with Abaca Improved Varieties	"	4	310	1,240	S.T.(1)-5Y, M.T.(3)-5Y
8) Introduction of Other Fiber Crops	"	3	160	480	M.T.-5Y
9) Planting with Coconut Improved Varieties	"	19	170	67,830	S.T.-5Y
10) Copra Drying and Coconut Shell Charcoal Making	"	2	420	840	S.T.-5Y
11) Pest/Disease Control Laboratory	stn	1	600	600	L.T.-10Y
12) Coconut Timber Utilization	site	2	15	30	S.T.-5Y
13) Trial/Demonstration of Agro Forestry	"	11	250	143	S.T.(2)-20Y, M.T.(9)-15Y
14) Carabao Dispersal	unit	1	200	180	S.T.-10Y
15) Swine Artificial Breeding Center	stn	2	600	1,200	S.T.-20Y
16) Swin Breeding Center	"	1	220	220	S.T.-10Y
17) Sheep/Goat Production Center	"	4	900	3,600	S.T.-10Y
18) Sheep/Goat Dispersal	site	6	130	780	S.T.(2)-5Y, M.T.(4)-5Y
19) Duck Farm for Dispersal	"	1	210	210	S.T.-5Y
20) Egg Farm	"	1	80	80	L.T.-10Y
21) Cattle Raising	"	4	170	680	L.T.-10Y
22) Slaughterhouse	"	21	150	3,150	S.T.(5)-20Y, M.T.(16)-15Y
23) Demonstration of Freshwater Fish Culture	"	6	100	600	S.T.-20Y
24) Nursery Pond	stn	2	270	540	M.T.-15Y
25) Market Assistance Center	"	3	320	960	M.T.(3)-15Y
26) Municipal Nursery	site	15	220	3,300	S.T.(2)-20Y, M.T.(13)-15Y
27) Organization and Management of Farmers Group	"	2	2,300	4,600	M.T.(2)-5Y
28) Functional Farmer's Dwelling Development	"	3	30	90	M.T.(3)-5Y

Note: S.T.- Short Term, M.T.- Medium Term, L.T.- Long Term.

(Cont'd)

Table M.6. Break Down of Annual Operation and Maintenance Cost (2/7)

(unit: 1,000 ₱)

Description		Unit	Q'ty	Rate	Amount	Remark
Small Scale and Cottage Industry Development						
1) Coconut Industry		stn	3	400	1,200	S.T.-5Y
2) Sales Display Center		"	3	200	600	S.T.(1)-20Y, M.T.(1)-15Y, L.T.(1)-10Y
3) Training/Services Center		"	3	700	2,100	S.T.(1)-20Y, M.T.(1)-15Y, L.T.(1)-10Y
4) Common Service Facility		"	1	200	200	S.T.-20Y
5) Center of Procurement, Storage and Selling Materials		"	1	220	220	S.T.-20Y
Irrigation and Drainage Development						
1) CIS, CIP Rehabilitation Project						
C1	Danao	ha	110	0.3	33	Short-Term
C10	Panaruan	"	60	0.3	18	
	(SWIMP)	lot	1	300	300	
	Sub-Total of Panaruan				318	
C3	Camaroboan	ha	100	0.3	30	- do -
C13	Hinikaan	"	20	0.3	6	- do -
C2	Calapi	"	230	0.3	69	- do -
C27	Casandig-Lawaan	"	90	0.4	36	- do -
C30	Tutubigan	"	100	0.3	30	- do -
C9	Tabucan	"	60	0.3	18	- do -
C29	Apolonia	"	20	0.3	6	- do -
C5	Mainbog-Tadcan	"	40	0.4	16	- do -
C7	Lantagan	"	50	0.4	20	- do -
C8	Placer	"	20	0.3	6	- do -
C4	Sn Andres	"	50	0.3	15	- do -
C28	Hilaba	"	20	0.3	6	- do -
C6	Tagalog	"	40	0.3	12	- do -
C24	Basyao	"	20	0.3	6	- do -
C23	Sulpan	"	30	0.3	9	- do -
C22	Lo-og	"	30	0.3	9	- do -
C21	Basey	"	20	0.3	6	- do -
C11	Sn Antonio	"	20	0.3	6	- do -
P1	Napuro	"	20	0.3	6	- do -
	(SWIMP)	lot	1	300	300	
	Sub-Total of Napuro				306	Medium-Term

(Cont'd)

Table M.6. Break Down of Annual Operation and Maintenance Cost (3/7)

(unit: 1,000 ₱)

Description		Unit	Q'ty	Rate	Amount	Remark
P17	Casandik-T	ha	70	0.4	28	Medium-Term
P3	Casandik-P	"	40	0.4	16	- do -
P11	Bangahon	"	30	0.4	12	- do -
P18	Calirocan	"	50	0.4	20	- do -
P10	Sn Pelayo	"	100	0.4	40	- do -
P9	Elenas	"	20	0.4	8	- do -
P14	Bulao-T	"	120	0.4	48	- do -
P19	Sn Miguel	"	50	0.4	20	- do -
P12	Parina	"	30	0.4	12	- do -
P8	Lapaz-P	"	60	0.4	24	- do -
P4	Bangon	"	30	0.4	12	- do -
P5	Mambog	"	15	0.4	6	- do -
2) CIS New Project						
1	Bayo	ha	230	0.3	69	Long-Term
2	Pilar	"	270	0.3	81	- do -
3	Sigo	"	100	0.3	30	- do -
4	Ton-ok	"	260	0.3	78	Medium-Term
5	Tabokno	"	80	0.3	24	Long-Term
6	Nabang	"	20	0.3	6	- do -
7	Alang-Alang	"	20	0.3	6	- do -
8	Sn Joaguin	"	20	0.3	6	- do -
9	Canipulan	"	20	0.3	6	- do -
10	Naga	"	100	0.4	40	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Naga				280	- do -
11	Carayman	ha	60	0.4	24	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Carayman				264	- do -
12	Obrero	ha	60	0.4	24	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Obrero				264	- do -
13	Maglawawaan	ha	30	0.4	12	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Maglawawaan				252	- do -
14	Navarro	ha	120	0.3	36	- do -
15	Gaboy	"	130	0.3	39	- do -
16	Sinantan	"	90	0.3	27	- do -
17	Ayolito	"	170	0.3	51	- do -
18	Rawis	"	380	0.3	114	Medium-Term
19	Penaplata	"	100	0.4	40	Long-Term
20	Pizaro	"	100	0.4	40	Medium-Term
21	Sto Mino	"	280	0.4	112	- do -
22	Giras	"	40	0.4	16	Long-Term
23	Pologon	"	110	0.3	30	Short-Term
24	Sapinit	"	160	0.3	48	Short-Term
25	Naghituiman	"	210	0.3	63	- do -
26	Janipon	"	160	0.3	48	- do -

(Cont'd)

Table M.6. Break Down of Annual Operation and Maintenance Cost (4/7)

(unit: 1,000 ₱)

	Description	Unit	Q'ty	Rate	Amount	Remark
27	Barayong	ha	260	0.4	104	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Barayong				344	Long-Term
28	Sta Rosa	ha	30	0.4	12	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Sta Rosa				252	- do -
29	Binoongan	ha	70	0.4	28	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Binoongan				268	- do -
30	Sta Risa	ha	370	0.4	148	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Sta Risa				388	- do -
31	Silaga	ha	450	0.3	135	Medium-Term
32	Tagaca	"	90	0.4	36	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Tagaca				276	Long-Term
33	Catabonan	ha	90	0.3	27	Medium-Term
34	Hinangutdan	"	50	0.4	20	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Hinangutdan				260	Long-Term
35	Bagolis	ha	140	0.3	42	Medium-Term
36	Sta Elena	"	160	0.4	64	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Sta Elena				304	- do -
37	Damoigan	ha	180	0.4	72	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Damoigan				312	Long-Term
38	Canmada	ha	480	0.4	192	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Canmada				432	Medium-Term
39	Dolongan	ha	340	0.4	136	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Dolongan				376	Long-Term
40	Cantaba	ha	260	0.4	104	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Cantaba				344	- do -
41	Basey	ha	1,340	0.4	536	
	(Tidal Gate)	lot	1	240	240	
	Sub-Total of Basey				776	- do -
42	Inumtan	lot	50	0.3	15	- do -
43	Lo-og	"	340	0.3	102	- do -
44	Independence	"	40	0.3	12	- do -
45	Karanas	"	60	0.3	18	- do -
46	Inungayan	"	70	0.3	21	- do -

(Cont'd)

Table M.6. Break Down of Annual Operation and Maintenance Cost (5/7)

(unit: 1,000 ₱)

	Description	Unit	Q'ty	Rate	Amount	Remark
47	Kalayaan-Patong	lot	600	0.3	180	Long-Term
48	Lawaan	"	70	0.3	21	- do -
49	Concepcion	"	50	0.3	9	- do -
50	Casandig	"	170	0.3	51	- do -
51	Camsotabao	"	500	0.3	150	- do -

Roads and Transportation Development

						(S.T) (M.T) (L.T)
Road	(Type A)	km	260	40	10,400	40 - 20 - 200
- do -	(Type B)	"	150	65	9,750	110 - 0 - 40
- do -	(Type C)	"	891.6	50	44,580	141.6 - 320 - 430
- do -	(Type D)	"	144	40	5,760	24 - 40 - 80
Bus Terminal	(Cathalogan)	unit	1	20	20	Short-Term
- do -	(Calbayog)	"	1	20	20	- do -
- do -	(Basey)	"	1	15	15	Medium-Term
- do -	(Gandara)	"	1	15	15	- do -

Mini-Hydro Power Development

1)	Bugtong Hydro Power Proj.	kw	1,800	0.9	1,620	Short-Term
2)	Tabubuo Mini-Hydro Power Proj.	"	60	0.9	54	Long-Term
3)	Malauog Mini-Hydro Power Proj.	"	120	0.9	108	- do -
4)	Matuguinao Mini-Hydro Power Proj.	"	350	0.9	315	- do -
5)	Malapgap Mini-Hydro Power Proj.	"	180	0.9	162	- do -
6)	Matatud Mini-Hydro Power Proj.	"	110	0.9	99	- do -
7)	Blanka R. Hydro Power Proj.	"	2,500	0.9	2,250	Medium-Term
8)	Aurora F. Mini-Hydro Power Proj.	"	30	0.9	27	Long-Term
9)	Tongbong Mini-Hydro Power Proj.	"	250	0.9	225	- do -
10)	Heruando Mini-Hydro Power Proj.	"	400	0.9	360	- do -
11)	Tagaoyang R. Mini-Hydro Power Proj.	"	160	0.9	144	- do -
12)	Ulot R. Hydro Power Proj.	"	3,800	0.9	3,420	Medium-Term
13)	Calbiga Mini-Hydro Power Proj.	"	1,400	0.9	1,260	Long-Term
14)	Sohoton R. Hydro Power Proj.	"	2,700	0.9	2,430	- do -
15)	Burgas Mini-Hydro Power Proj.	"	400	0.9	360	- do -
16)	Pord Mini-Hydro Power Proj.	"	360	0.9	324	- do -

Rural Electrification Development

1)	Transmission Line	MWH	42,000	0.05	2,100	Long-Term
2)	Distribution Line for Area-1	"	13,200	0.05	660	50%-80%-100%
3)	Distribution Line for Area-2	"	27,000	0.05	1,350	- do -

(Cont'd)

Table M.6. Break Down of Annual Operation and Maintenance Cost (6/7)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Rate	Amount	Remark
Rural Water Supply Development					
1) Calbayog Rural Area	m^3/d	18,000	0.14	2,520	Short-Term
2) Calbiga Rural	"	2,000	0.14	280	- do -
3) Basey Rural	"	5,000	0.14	700	- do -
4) Pinabacdao Deepwell Develop.	"	1,400	0.14	196	Medium-Term
5) San Sebastian Deepwell Develop.	"	700	0.14	98	- do -
6) Pagsanghan Deepwell Develop.	"	1,300	0.14	182	- do -
7) Catbalogan Rural Area	"	18,000	0.14	2,520	Long-Term
8) Taranguan Deepwell Develop.	"	2,600	0.14	364	- do -
9) Santa Rita Deepwell Develop.	"	2,400	0.14	336	- do -
10) Talalora Deepwell Develop.	"	900	0.14	126	- do -
11) Villareal Deepwell Develop.	"	2,900	0.14	406	- do -
12) Marabut Deepwell Develop.	"	2,300	0.14	322	- do -
13) Matuguinao Deepwell Develop.	"	500	0.14	70	- do -
14) San Jose De Buan Deepwell Develop.	"	1,000	0.14	140	- do -
Health Development					
1) Health Facilities					(S.T) (M.T) (L.T)
Hospital Bed	bed	870	8	6,960	230 - 170 - 470
Barangay Health Station(BHS)	unit	190	6	1,140	30 - 40 - 120
Solar Cold Chain	"	16	10	160	16 - 0 - 0
Sub-Total				8,260	
2) Manpower Development Program					
Doctor	No.	70	47	3,290	20 - 10 - 40
Nurse	"	50	24	1,200	30 - 10 - 10
Midwife	"	50	16	800	20 - 20 - 10
Dentist	"	20	36	720	10 - 10 - 0
Sanitary Inspector	"	10	16	160	10 - 0 - 0
3) Comprehensive Material and Child Health Program	unit	1	1,800	1,800	S.T.-20Y
4) Health Manpower Development	"	1	1,000	1,000	S.T.-20Y
5) Herbal Medicine Project	"	1	500	500	S.T.-20Y
6) Family Planning	"	1	1,000	1,000	S.T.-20Y
7) Population Information Management and Dissemination Program	"	1	100	100	S.T.-20Y
Education Development					
1) School Building					(S.T) (M.T) (L.T)
Elementary School Building	room	1,900	3	5,700	530 - 650 - 720
Secondary School Building	"	300	3	900	80 - 120 - 100
Tertiary School Building	unit	3	2,000	6,000	1 - 1 - 1
Sub-Total				12,600	

(Cont'd)

Table M.6. Break Down of Annual Operation and Maintenance Cost (7/7)

(unit: 1,000 ₱)

Description	Unit	Q'ty	Rate	Amount	Remark
2) Curriculum Development	lot	1	500	500	S.T.-20Y
3) Staff Development	"	1	500	500	S.T.-20Y
4) Student Financial Assistance Program	"	1	200	200	S.T.-20Y
5) Research and Development Program	"	1	200	200	S.T.-20Y
Communication Development					
1) Telecommunication Facilities					(S.T) (M.T) (L.T)
1. Establishment of NTTS Stn.	stn.	28	230	6,440	4 - 24 - 0
2. Establishment of New Telegraph Station	"	4	230	920	4 - 0 - 0
3. Conversion from Wire Telegraph to HF/CW Radio Station	"	10	10	100	10 - 0 - 0
4. Replacement of Old and Defective Radio Equipment	"	14	5	70	14 - 0 - 0
5. Repair of Telecom Building	"	24	10	240	7 - 7 - 10
6. Reconstruction of Outside Plant and Repair of Inside Plant Facilities for Rural Telephone Exchange	"	1	80	80	1 - 0 - 0
7. Expansion of Outside Plant Facilities for Rural Telephone Exchange	"	5	150	750	1 - 0 - 4
8. Establishment of New Telephone Stn.	"	4	1,300	5,200	1 - 3 - 0
Sub-Total				13,800	
2) Postal Communication Facilities					
1. Construction of City Post Office	stn.	1	800	800	1 - 0 - 0
2. Construction of Bureau Owned Bldg.	"	26	50	1,300	26 - 0 - 0
3. Establishment of Postal Station in Rural Area	"	28	300	8,400	7 - 7 - 14
Sub-Total				10,500	

APPENDIX N. AGRO-ECONOMY

APPENDIX N. AGRO-ECONOMY

APPENDIX N. AGRO-ECONOMY AND PROJECT EVALUATION

N.1. Farm Economy

N.1.1. Average Farm Size

Most of the respondents who produce paddy have a farm size of two hectare or less indicating that a high percentage of the farmers are cultivating an area of less than two hectares. Very few farmers are cultivating more than five hectares.

Farmers with bigger farms are mostly owners or part owners. Furthermore, these farmers holding bigger areas have more livestocks especially carabao and pig, because they have bigger farms, they can fallow some areas for a season to be used as pasture for their carabaos.

Crops grown by those who have bigger farms on hilly and mountainous area vary from upland rice, corn, peanut, rootcrops to coconut. Majority of those who plant corn or coconut own a bigger size of farm land than that of paddy production farmers who live in lowland area.

Average farm size for paddy production farmer, corn production farmer and coconut production farmer is estimated from "1980, Census of Agriculture (NCSO)" at 2.4 ha, 3.1 ha and 3.3 ha, respectively. It is slightly different from the result of farm economy survey conducted by Study Team (refer to Tables N.1.1 and N.1.2).

N.1.2. Tenure Status

The farmer respondents are classified according to ownership of land they cultivate. There are owners, leasehold tenant, share tenant and combination of the above categories. Owners are those

who they own the land they till. Leasehold tenants are those who rent the area in fixed amount either in cash or in kind. Share tenant is a tenure group of farmers paying rent to the landlord for use of the land. The rent is proportional to the production obtained by the farmers after deducting the share of harvesters and threshers.

Tenure status was classified in three categories in this Study as full owner, part owner and tenant. Full owner and part owner is distinguished as "owner" (above mentioned) "with" or "without" combination of other categories. Tenant means lease hold tenant and share tenant. Tenure status was surveyed by farm economy survey in totally 602 farms in the area, it shows quite different proportion by area (refer to Table N.1.3).

N.1.3. Farm Input and Output

The number of retailer and wholesaler who deals with agricultural inputs are reported at 675 in the area as of 1985. This averaged 22 retailers and 3 wholesalers are available per municipality. Most of retailers sell simple farm tools and equipment like bolos, harvest tools, harrows and shovels, and wholesalers are dealing with fertilizers, disinfections and relatively bigger size of farm machinery. These dealers are concentrated in poblacion, therefore only the farmers who live near them can touch them.

The production and disposal of crops are slightly different by season. In the wet season, the farmers obtain higher production of seasonal crops such as rice and corn. This can be attributed to the availability of soil moisture necessary for the plants. A number of farmers are suffering from excessive dryness consequently reducing the yield. Considerable portions of corn, copra, cassava and vegetables are considered to be marketed. About 30% of rice produced is family consumption and 20 to 55% is marketed. The remaining quantities are used as payment for services like threshing

and milling, or paid as landlord share and credit (refer to Figure N.1.1).

N.1.4. Estimated Family Income and Expenditures Pattern

Family Income by farm size and by type of crop production was estimated using the result of crop and livestock budgets analysis based on the farm economy survey. The tables hereinafter include the income estimation of typical crop production farmers; 2.4 ha for paddy production farmer, 3.1 ha for corn production farmer and 3.3 ha for coconut production farmer, respectively.

Family income and expenditure by area was summarized from farm economy survey. Hamonini area shows the highest income and expenditure, on the contrary Gandara area illustrated the lowest (refer to Table N.1.4).

To uplift the lifestyle, it is one of the way to decrease the expenditures especially food cost. One day food cost per capita in the area is calculated as follows;

$$15,937 \times 0.672/(5.4 \times 365) = 5.4 \text{ pesos}$$

Where;

15,937 ... Average annual expenditure per household
0.672 ... Percent of food cost (refer to Table N.1.5)
5.4 ... Average family members in the area
365 ... days, one year

N.1.5. Food Purchases

1) Provincial characteristics of food purchases

It could generate an idea that the people in the area are rice eaters, because the fact that inspite of the lower price of corn grids, many people still prefer to buy rice than corn. Purchases of

food items would be seldom when the farmers had just harvested their crop and would be on its peak at the time when the harvest are already consumed and next crop is not yet harvested.

Buying of rice is at its peak from August to September in the area. In this period, rice is transferred from other region, mainly from Tacloban, Cebu and Bacolod. In case of corn, not so many farmers buy the item on April and May. Rootcrops were also raised and to the insufficient food supply in the year round (refer to Table N.1.6).

A factor that may be associated with the trend in food purchases is the kind of crop the farmers are growing. Since rice is the dominant crop in the place, the family get used to eating rice. During times when their production could not meet their needs, farmers, prefer to buy rice than corn. Although corn is raised in the area, some people do not use it for food but rather produce it for sale and feed to animals. This is commonly given to pigs.

2) Average one day per capita food cost

Average one day per capita food cost in the area was calculated about five pesos, which is considered to be allocated mainly cereals and cereal products and fish, meat and poultry. On the other hand, nutritionary-adequate diet cost per day was calculated at 16 pesos (refer to Tables N.1.7 and N.1.8).

N.2. Project Evaluation

N.2.1. Procedure of Financial Analysis

1) The calculation of family consumption by food items

The family consumption per year is calculated by food items based on the "Recommendable Dietary Allowance (RDA) per year for

specific food groups" and "Annual per capita rates of food items, E. Visayas" provided by FNRI. The average family members used in this analysis was 5.8.

2) The estimation of the land resources by established household model

The land resources in the present and the future situation are estimated based on the actual land holding area and the estimated cropping intensity. To estimate the future land area, projected area expansion rate which express the percentage of uneffective land increase was multiplied to the present paddy, corn and coconut area. The number of livestocks by household model were estimated and projected based on the farm economy survey.

3) The estimation of the production disposal by established household model

Based on the food requirements, the production disposal is estimated. The assumptions on which the production disposal is based are; i) the household consume their production up to their consumption would reach the required quantity, ii) the remnant of the consumption is sold, iii) in case of part owner, 15% of the total crop production is shared with land owner, iv) in case of tenant, 25% of the total crop production is shared with land owner, and v) the seeds preserved per hectare are 50 kg for paddy, 20 kg for corn and 6 kg for coconut, respectively.

4) Financial analysis

a) Other cash expenditures

Food expenditures and non-food expenditures are included in other cash expenditures. The required food items are selected from three kind of food groups, namely, energy foods, body-building foods and regulating foods which meet the sufficient metabolisable energy and the adequate nutrition. The unit cost of the food items are adapted from the present marketing price in the area and purchasing kilo grams are calculated as required kilo grams minus consumable kilo grams.

Non-food expenditures are estimated by household model taking into consideration the 30% of miscellaneous expenses. Other cash expenditures are summerized by household model.

b) Cash production costs and financial analysis (Table N.2.1.to N.2.12)

The cash production costs were estimated by household model under the present and the future situation based on their land resources above mentioned, and the estimated production cost by crop under the same situation. The following assumptions were made to estimate the cash production costs and financial analysis. The heading number of the assumptions written in below is to correspond to the heading number of Tables N.2.1 to N.2.12.

1. Market Production
1.1. Market Production (Crops) - Total crop production minus family consumption and production retained for seed.
1.2. Market Production (Livestock) - Total livestock productions minus family consumption.
1.3. Market Production (Inland Fishery) - same as livestock.

2. Family Consumption - Farm Production consumed in household.

3. Seed - Seed value for crop retaining by household.

4. Payment to Land owner - Based on prevailing custom in ADPP area; sharing arrangement is 75:25.

5. Farm Labor - Based on prevailing custom in the ADPP area; hired human labor in ₱30/day and hired animal labor is ₱20/day.

6. Planting Materials - Actual cost of planting materials minus value of seeds retained.

7. Interest
7.1. Loan Repayment - Ten-month loan for materials at 50 percent p.a.
7.2. Other Charges - Includes transportation charge for farm input/output, farmer's association charge, irrigation fee, crop insurance and farm debt, etc. Crop insurance is based at ₱120/ha and farm debt is averaged at ₱700 in the ADPP area.
7.3. Land Tax - Based on ₱75/ha for upland area.

8. Total Production Cost - Sum of above items 5 to 7.

9. Net Farm Income - Market production plus Family Consumption plus seed minus Total Production Cost.

10. Cash Income

10.1. Cash Income (crop, Livestock & Fisheries) - Market Production.

10.2. Cash Income (Off-Farm) - same as farm labor mentioned above. Average days in carabao rent in the ADPP area is 40 per year.

10.3. Cash Income (Non-farm) - Include subsidiary job and remittance from family members, etc. Average in the ADPP area is ₱2,750 per household.

11. Total Cash Income - Sum of above item 10.

12. Cash Expenditure

12.1. Cash Expenditure (Crop, Livestock and Fisheries) - Cash Production Cost

12.1. Cash Expenditures (Other) - Estimated by household model

13. Total Cash Expenditure - Sun of above 12

14. Family Cash Balance - Total cash income mine total cash expenditure

N.2.2. Economic Analysis

1) Human labor

Unskilled rural labor is costed at market wage rate at the peak period in the financial analysis since labor is hired only in this period. The economic cost of unskilled rural labor is based on a weighted average of the financial costs of three period of the year; peak, slack and minimum employment periods for the present, and the future without and with project situations. The economic price of unskilled labor is calculated at ₱16.4 for the present and the future without project situations and ₱19.89 for the future with project situation (refer to Table N.2.13).

2) Conversion factors

The standard conversion factor, group and specific conversion factors are used to adjust the financial price to the economic price (refer to Table N.2.14).

3) Economic price of farm inputs and outputs

All the farm inputs and outputs which concern the project are valued at international border price. The economic pricing of major farm inputs and outputs was made based on World Bank primary commodity price forecasts as of August 1987, and the economic pricing of minor farm inputs and outputs was made based on the financial cost (refer to Table N.2.15 to N.2.16).

4) Irrigation project

a) Project benefits

Only direct irrigation benefits were considered in the economic analysis as derived from "with" and "without" project conditions at full development. Projected land use and cropping intensities, yields and prices, cost of paddy production and the assumed percentage of farm labor cost were used in the economic analysis of the net value of the production. The percentage of farm labor cost are assumed at 25% of gross value of product. The net incremental benefit per hectare at full project development is estimated at 3,000 pesos, which was induced from taking the difference between the net value of crop production with and without project after taking into account the assumed cost of farm labor. The projected economic life of the project is 30 years, that includes three years construction period. Full development of the project is expected to be attained three years after completion.

b) Project cost

Project cost should also be converted to economic value, however taking into account for aberrations of this value, financial price can be taken for economic price.

c) Economic internal rate of return (EIRR)

EIRR was calculated by cost per hectare. From the point of the national economy, those projects which cost less than 20,000 pesos per hectare are only feasible. However, many projects which consist of drainage systems for schistosomiasis control are impossible to numerate. Those project should be evaluated from the viewpoint of fulfillment of basic human needs for inhabitants (refer to Figure N.2.1).

5) Rural water supply project

Generally water charge per gallon for level III system is around 0.05 pesos for domestic use, 0.1 pesos for commercial use and 0.17 pesos for industrial use, respectively. And the more they use the water, the cheeper the charge becomes.

In calculating the water charge for priority projects, the following assumptions were made.

- Average family member is 5.4 persons
- U.S gallon is commonly used in the area, therefore "gallon" means U.S gallon about 4 liters.
- Average water amount necessary for one family per day is 37.5 gallons (150 liters).
- Annual interest is 10%

According to the calculation, water charge is lowest in Calbayog project (0.06 pesos) and highest in Pinabacdao project (0.19 pesos). This indicates that introduction of level III system would economically feasible if they can establish steady organization which covers operation and maintenance including water charge gathering (refer to Table N.2.17).

6) Mini-hydropower project

a) General

Economic benefits from hydropower project will be calculated on the assumption that an alternative thermal power plant with the capacity to generate power equivalent to the average firm peak on the proposed hydropower project would be provided. The construction and operation and maintenance costs would be regarded as the amount equivalent to the benefit accruing from the proposed hydropower project.

b) Economic benefits

- Economic construction Cost of the Alternative Diesel Power Plant

The applicable economic cost for the construction of the diesel power plant is about ₱11,000/Kw at the 1987 price level.

- Economic Operation and Maintenance Costs of the above

  Applicable economic annual operation and maintenance costs (including A & G cost) are 2% of the construction cost.

- Economic Cost of Fuel and Lubricating Oil

  The applicable economic price of fuel (i.e., diesel oil) is 2.18 ₱/liter at the 1987 price level and fuel consumption is understood at 600 kwh/barrel. (i.e., 0.256 liter/kwh ---- 1 barrel = 159 liters)

  Modification should be made on the above economic price in computing benefit. The 1997 projected price using 1987 constant price level is recommended. The above economic price does not include tax and subsidy. The land transportation cost should be adjusted using the 0.78 conversion factor. The price escalation of petroleum in 1997 is projected 142.70%. If these coefficient would be used to the above economic price, price of fuel to be applied for benefit computations would be 3.10 ₱/liter (₱2.18 x 1.4270).

- Amortization of Initial Investment Costs

  The life span of a diesel plant is 20 years. Usually, after the 20th year, the diesel plant is scrapped. For purpose of amortization, 10 percent interest rate is usually used and capital recovery factor is computed at 0.1174.

c) Economic cost

i) Conversion factor

Standard conversion factor (0.82) was applied to calculate economic initial cost and operation and maintenance cost.

ii) Economic internal rate of return (EIRR)

EIRR is shown in Table N.2.18.

7) Job creation

Job creation number was calculated by sector and by target term (refer to Tables N.2.19).

N.2.3. Desirable Farming Pattern by Type of Crop Production

To attain the family income target of 57,193 pesos, desirable farming pattern by type of crop production was estimated in considering the availability of family man-power. As mentioned in Appendix N.2.1, it is impossible to attain the family income target, therefore, the augmentation of income from subsidiary business is strongly encouraged. It is desirable at least one member per family should participate to non-farm business which is considered as the source of subsidiary income. In this estimation, two types of farming patterns were suggested, one is to expand the farm size (case 1), and the other is to estimate the non-farm income without consideration of expansion of farm size (case 2). The desirable number of livestocks in each case was also shown in the figures, which can sufficiently be feeded by family man power or hired labor force (refer to Figure N.2.2 to N.2.4).

Table N.1.1 Average Farm Size by Type of Crop Production in Samar Province

Type of Farm		Total Physical Area of Farms (ha)	Total Number of Farms 1/	Average Farm Size (ha/farm)
Paddy	(Owned)	32,547	15,014	2.2
	(Rented Leased)	10,899	6,938	1.6
	(Others)	519	1,452	0.4
	(Average)	43,965	18,249	2.4
Corn	(Owned)	13,012	3,940	3.3
	(Rented Leased)	6,370	2,621	2.4
	(Others)	297	605	0.5
	(Average)	19,679	6,358	3.1
Coconut	(Owned)	45,810	14,977	3.1
	(Rented Leased)	12,427	4,220	2.9
	(Others)	224	438	0.5
	(Average)	58,461	17,779	3.3

Note : 1/ A farm is counted only once. The sum of the reported number of farms by fenure may not be equal to the total number of farms.

Source: Arranged from "1980, Census of Agriculture" published by NCSO.

Table N.1.2. Farm Size by Type of Crop Production 1/

Farm Size (hectare)	Type of Crop Production					
	Paddy		Corn		Coconut	
	Reported	%	Reported	%	Reported	%
less than 1	3	11	0	0	0	0
1.1 - 2.0	11	42	3	18	0	0
2.1 - 3.0	5	20	3	18	2	1
3.1 - 4.0	5	20	7	41	13	33
4.1 - 5.0	2	7	2	12	19	48
5.1 or more	0	0	2	11	6	18
Total	26	100	17	100	40	100
Highest (ha)	4.9		6.5		9.7	
Lowest (ha)	0.8		1.9		2.4	
Mean (ha)	1.6		3.2		5.1	

Note : 1/ Total 83 farms are surveyed.

Source: Farm economy survey conducted by Study Team.

Table N.1.3

TENURE STATUS

	GANDARA AREA				Hamonini AREA				HINABANGAN				BASEY				TOTAL		
	FULL OWNER	PART OWNER	TENANT	TOTAL	FULL OWNER	PART OWNER	TENANT	TOTAL	FULL OWNER	PART OWNER	TENANT	TOTAL	FULL OWNER	PART OWNER	TENANT	TOTAL	FULL OWNER	PART OWNER	TENANT
NUMBER	61	76	39	176	41	57	52	150	25	1	7	33	70	73	0	143	197	207	98
%	34	43.2	22.2		27.3	38	34.7		75.75	3.03	21.2		48.9	51.1	0		39.2	41.2	19.5

Source; Farm Economy Survey conducted by JICA Study Team.
(Surveyed at eight barangays in four municiparity)

Table N.1. 4 Annual Farm Income and Expenditure by Area

Area	Income (pesos)	Expenditure (pesos)
Gandara	17,180	16,321
Hamonini	28,164	26,755
Hinabungan	19,068	18,115
Basey	20,883	19,839

Note : Sample number of farms are as follows;
Gandara (33),
Hamonini (30),
Hinabangan (10),
Basey (10).

Source: Farm Economy Survey conducted by Study Team.

Table N.1.5 Expenditures Pattern

Item	Percent of Family Expenditure		
	Western Samar	Region VIII	Whole Country
Foods	67.2 %	63.4 %	42.4 %
Housing and Household furnishing	9.5 %	10.8 %	25 %
Miscellaneous	15.8 %	16.7 %	10.7 %
Education	2.0 %	2.4 %	3.7 %
Clothing	2.8 %	3.2 %	3.0 %
Recreation and Personal Care	2.7 %	3.5 %	5.2 %
Total	100 %	100 %	100 %

Source: 1985 Family Income and Expenditures Survey (NCSO)

Table N.1.6 Dispersal Operation of Major Grains
Inflow/Outflow From/To Western Samar
Managed by NFA

(Unit: Cavan)

Year	Rice			Paddy			Corn Grids			Corn Grains			Total		
	Outflow	Inflow	Balance	Outflow	Inflow	Balance	Outflow	Inflow	Balance	Outflow	Inflow	Balance	Outflow	Inflow	Balance
1977	3,939	65,676	△61,737	2,054	0	2,054	0	7,698	△7,698	2,628	0	2,628	8,621	73,374	△64,753
1978	11,400	0	11,400	0	1,028	△1,028	0	5,956	△5,956	0	0	0	11,400	6,984	4,416
1979	491	700	△ 209	12,112	0	12,112	0	0	0	0	0	0	12,603	700	11,903
1980	5,045	45,695	△40,650	31,989	0	31,989	1,405	1,200	205	0	82	△ 82	38,439	46,977	△ 8,538
1981	506	40,849	△40,343	330	0	330	0	4,090	△4,090	0	0	0	836	44,939	△44,103
1982	5,930	65,522	△59,592	0	0	0	0	1,449	△1,449	2,085	0	2,085	8,015	66,971	△58,956
1983	2,740	238,171	△235,431	10,475	0	10,475	0	6,232	△6,232	2,894	0	2,894	16,109	244,403	△228,294
1984	3,542	47,060	△43,518	0	0	0	1,948	3,015	△1,067	0	0	0	5,490	50,075	△44,585
1985	8,612	83,162	△74,550	0	0	0	0	0	0	0	248	△ 248	8,612	83,410	△74,798
1986	44,232	64,664	△20,432	0	0	0	0	2,367	△2,367	0	58	△ 58	44,232	67,089	△22,857
Total	86,437	651,499	△565,062	56,960	1,028	55,932	3,353	32,007	△28,654	7,607	388	7,219	154,357	684,922	△530,565

Note: 1 Cavan = 50 kg.
Inflow for Rice are from; Tacloban (35%), Cebu (35%), Bacolod (20%), Others (10%)
Inflow for Palay is mainly from Tacloban.
Inflow for WCT and WGN is mainly from Cebu.
Destinations of Outflow for Rice are; Catarman (55%), Manila (25%), Others (20%)
Destinations of Outflow for Paddy Rice are; Tacloban (85%), Cebu (15%)
Destination of Outflow for WCT and WGN is mainly to Manila.

Table N.1.7 Mean One Day per Capita Food and Nutrient Intake Compared with Recommended Dietary Allowance (RDA) in Visayas Area 1982

Food Group/Nutrient	Intake (1)	RDA (2)	Intake in % of RDA (1)/(2)
Food Group (Edible Portion, Grams)			
1) Cereals & Cereal Products	363	334	108.7
2) Starchy roots & Tubers	29	61	47.5
3) Sugars & Syrup	18	24	75.0
4) Dried Beans, Nuts & Seeds	10	17	58.8
5) Green Leafy & Yellow Vegetables	47	57	82.4
6) Vitamin C-Rich Foods	27	57	47.4
7) Other Fruits & Vegetables	133	89	149.4
8) Fish, Meat & Poultry	159	94	169.1
9) Eggs	7	21	33.3
10) Milk & Milk Products	30	82	36.6
11) Fats & Oils	10	28	35.7
12) Miscellaneous	44	-	-
Nutrient			
1) Calories (Kcal)	1,745	2,030	86.0
2) Protein (g)	51.3	50.8	101.0
3) Fat (g)	24	-	-
4) Carbohydrates (g)	324	-	-
5) Calcium (g)	0.42	0.56	75.0
6) Iron (mg)	10.7	11.7	91.4
7) Vitamin A (I.U.)	2,063	3,532	58.4
8) Thiamine (mg)	0.66	1.62	64.7
9) Riboflavin (mg)	0.53	1.03	51.5
10) Niacin (mg)	15.6	13.8	113.0
11) Ascorbic Acid (mg)	58.8	67.7	86.8

Source: FNRI

Table N.1.8 Calculation Sheet for Cost of Nutritionally-Adequate Diets Per Day

	Energy Foods					Body Building Foods			Regulating Foods		
	Cereals Rice	Camote/ Potatoes	Sugar	Fats/ Oils	Whole Milk	Fish/Meat Poultry	Eggs	Dried Beans/ Nuts/Seeds	Leafy/Yellow Vegetables	Vitamin C-Rich Foods	Other Fruits/ Vegetables
Recommended intake kg per capital/year 1/	122	27	9	10	30	55	183 (pcs.)	6	32	27	49
Purchased Price Per kg. 2/	6.5	1.25	7	17	65	36	1.65	P/12	3	15	3
Price per Year	793	33.75	63	170	1950	1,925	301.95	72	96	405	147
Price Per Day	2.17	0.09	0.17	1.46	5.34	5.27	0.82	0.19	0.26	1.10	0.40

Total Food Cost (Nutritionally Adequate) Per day P16.27

1/ FNRI

2/ Average Market Price in Catbalogan Surveyed by Study Team (Sept. 1987).

Figure N.1.1 Use of Crop Production

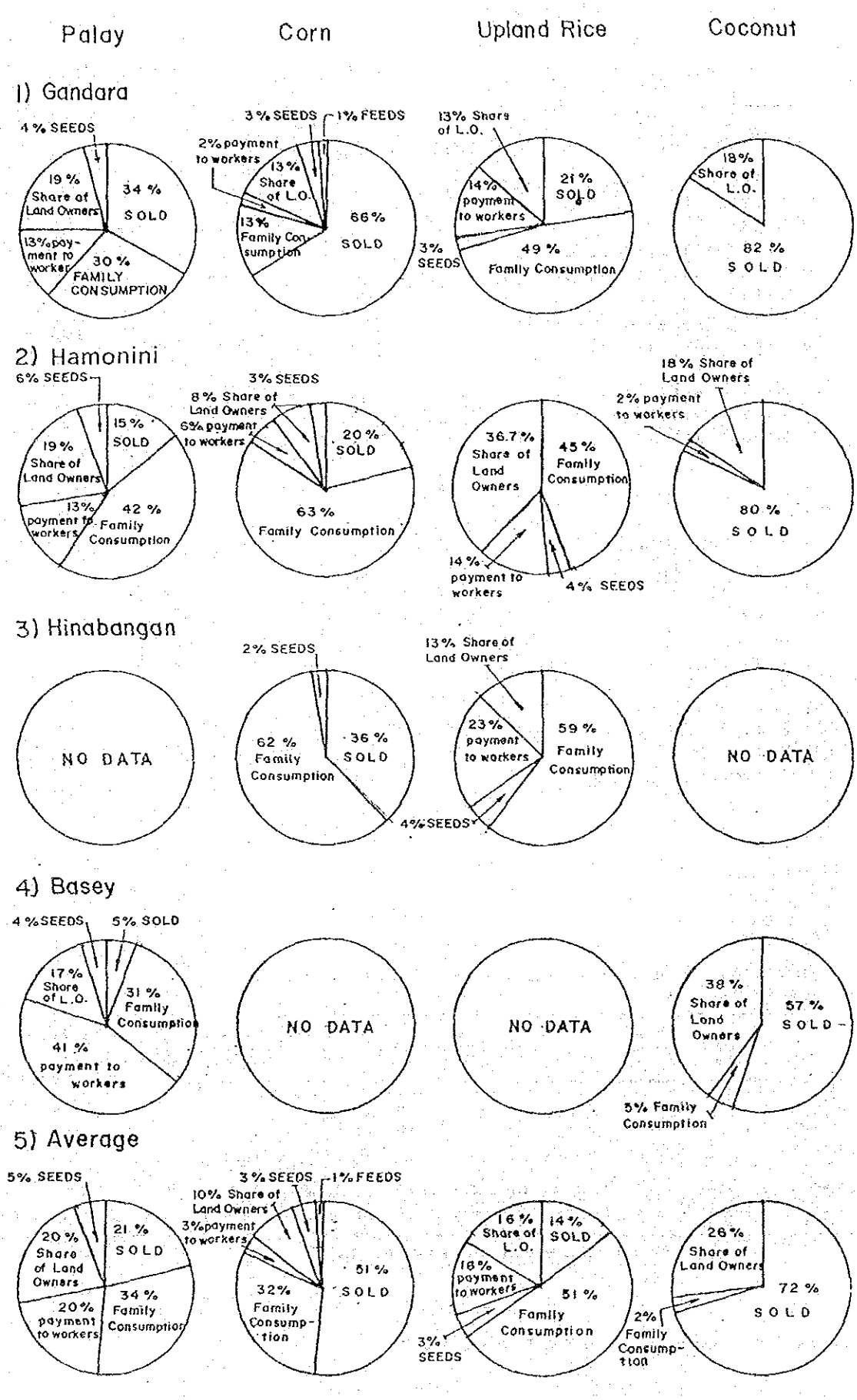


Table N.2.1. - Financial Analysis -

Area and Household Model: Paddy (Rainfed) (Owner-cultivator)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	7,103	7,598	12,021
- Livestocks	3,320	3,470	6,890
- Fisheries	-	-	-
2. Family Consumption			
- Crops	3,327	3,327	4,125
- Livestocks	2,848	2,920	11,900
- Fisheries	-	-	-
3. Seed	290	302	334
4. Payment to Land Owner	-	-	-
5. Farm Labor			
- Hired Human Labor	98	102	116
- Hired Animal Labor	42	44	50
6. Planting Material			
- Planting Materials	100	100	150
- Fertilizer			
Urea (10%)	36	38	154
Phosphate (10%)	36	38	154
Sulphate (10%)	36	38	154
Complex (70%)	252	262	1,075
- Pesticides	195	203	981
- Herbicides	0	0	26
- Rodenticides	0	0	142
- Other			
Sacks	240	255	335
Shed	0	0	75
Equipment Hire	0	0	20
Tools	0	0	50
Fencing	0	0	30
7. Interest			
- Loan Repayment	188	206	206
- Other Charges	0	0	278
- Land Tax	165	174	174
8. Total Production Cost	1,388	1,460	4,170
9. Net Farm Income	15,500	16,157	31,100
10. Cash Income			
- Crop	7,103	7,598	12,021
- Livestock	3,320	3,470	6,890
- Fisheries	-	-	-
- Off-farm	960	960	960
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	14,133	14,778	22,621
12. Cash Expenditure			
- Crop	1,388	1,460	4,170
- Livestock	500	500	1,500
- Fisheries	-	-	-
- Other	11,490	11,335	5,878
13. Total Cash Expenditure	13,378	13,759	11,548
14. Family Cash Balance	755	3,443	11,073
Say	800	3,400	11,100

Table N.2.2. - Financial Analysis -

Area and Household Model: Paddy (Rainfed) (Part-owner)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	3,379	3,418	6,522
- Livestocks	96	240	1,880
- Fisheries	-	-	-
2. Family Consumption			
- Crops	2,966	2,979	4,257
- Livestocks	1,634	1,670	3,815
- Fisheries	-	-	-
3. Seed	198	198	219
4. Payment to Land Owner	1,188	1,199	1,712
5. Farm Labor			
- Hired Human Labor	32	33	33
- Hired Animal Labor	28	28	28
6. Planting Material			
- Planting Materials	50	50	100
- Fertilizer			
Urea (10%)	27	28	98
Phosphate (10%)	27	28	98
Sulphate (10%)	27	28	98
Complex (70%)	191	193	689
- Pesticides	111	113	552
- Herbicides	5	5	24
- Rodenticides	0	0	29
- Other			
Sacks	120	120	190
Shed	0	0	50
Equipment Hire	0	0	30
Tools	0	0	30
Fencing	0	0	20
7. Interest			
- Loan Repayment	112	114	114
- Other Charges	350	350	144
- Land Tax	89	90	90
8. Total Production Cost	1,169	1,180	2,447
9. Net Farm Income	7,098	7,325	14,246
10. Cash Income			
- Crop	3,379	3,418	6,522
- Livestock	90	240	1,880
- Fisheries	-	-	-
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	6,699	6,888	11,632
12. Cash Expenditure			
- Crop	1,169	1,180	2,447
- Livestock	300	400	1,000
- Fisheries	-	-	-
- Other	5,230	5,323	6,916
13. Total Cash Expenditure	6,699	6,903	10,657
14. Family Cash Balance	0	Δ 15	975
Say	0	0	1,000

Table N.2.3. - Financial Analysis -

Area and Household Model: Paddy (Rainfed) (Tenant)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	1,191	1,191	2,373
- Livestocks	90	240	1,080
- Fisheries	-	-	-
2. Family Consumption			
- Crops	2,646	2,678	2,880
- Livestocks	1,634	1,670	2,615
- Fisheries	-	-	-
3. Seed	153	153	169
4. Payment to Land Owner	1,328	1,337	1,816
5. Farm Labor			
- Hired Human Labor	0	0	0
- Hired Animal Labor	20	21	21
6. Planting Material			
- Planting Materials	-	-	-
- Fertilizer			
Urea (10%)	7	7	36
Phosphate (10%)	7	7	36
Sulphate (10%)	7	7	36
Complex (70%)	49	50	254
- Pesticides	40	40	232
- Herbicides	0	0	7
- Rodenticides	0	0	29
- Other			
Sacks	40	40	65
Shed	0	0	35
Equipment Hire	0	0	15
Tools	0	0	25
Fencing	0	0	15
7. Interest			
- Loan Repayment	0	0	0
- Other Charges	700	700	0
- Land Tax	0	0	0
8. Total Production Cost	870	872	806
9. Net Farm Income	4,844	5,060	8,311
10. Cash Income			
- Crop	1,191	1,191	2,373
- Livestock	90	240	1,080
- Fisheries	-	-	-
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	4,511	4,661	6,683
12. Cash Expenditure			
- Crop	870	872	806
- Livestock	300	460	800
- Fisheries	-	-	-
- Other	3,346	3,449	5,112
13. Total Cash Expenditure	4,516	4,721	6,718
14. Family Cash Balance	Δ 5	Δ 60	Δ 35
Say	0	0	0

Table N.2.4. - Financial Analysis -

Area and Household Model: Paddy (Future Irrigated)
(Owner-cultivator)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	7,103	7,598	15,349
- Livestocks	3,320	3,470	6,890
- Fisheries	-	-	-
2. Family Consumption			
- Crops	3,327	3,327	4,598
- Livestocks	2,848	2,920	11,900
- Fisheries	-	-	-
3. Seed	290	302	436
4. Payment to Land Owner	-	-	-
5. Farm Labor			
- Hired Human Labor	98	102	140
- Hired Animal Labor	42	44	60
6. Planting Material			
- Planting Materials	100	100	150
- Fertilizer			
Urea (10%)	36	38	193
Phosphate (10%)	36	38	193
Sulphate (10%)	36	38	193
Complex (70%)	252	262	1,348
- Pesticides	195	203	1,240
- Herbicides	0	0	35
- Rodenticides	0	0	172
- Other			
Sacks	240	255	435
Shed	0	0	75
Equipment Hire	0	0	20
Tools	0	0	50
Fencing	0	0	30
7. Interest			
- Loan Repayment	188	206	206
- Other Charges	0	0	709
- Land Tax	165	174	174
8. Total Production Cost	1,388	1,460	5,423
9. Net Farm Income	15,500	16,157	33,750
10. Cash Income			
- Crop	7,103	7,598	15,349
- Livestock	3,320	3,470	6,890
- Fisheries	-	-	-
- Off-farm	960	960	960
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	14,133	14,778	25,949
12. Cash Expenditure			
- Crop	1,388	1,460	5,423
- Livestock	500	500	1,500
- Fisheries	-	-	-
- Other	11,953	11,799	6,058
13. Total Cash Expenditure	13,841	13,759	12,981
14. Family Cash Balance	292	1,019	12,968
Say	300	1,000	13,000

Table N-2.5. - Financial Analysis -

Area and Household Model: Paddy (Future Irrigated) (Part-owner)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	3,379	3,418	7,743
- Livestocks	90	240	1,880
- Fisheries	-	-	-
2. Family Consumption			
- Crops	2,966	2,979	3,839
- Livestocks	1,634	1,670	3,815
- Fisheries	-	-	-
3. Seed	198	198	285
4. Payment to Land Owner	1,188	1,199	2,006
5. Farm Labor			
- Hired Human Labor	32	33	47
- Hired Animal Labor	28	28	40
6. Planting Material			
- Planting Materials	50	50	100
- Fertilizer			
Urea (10%)	27	28	121
Phosphate (10%)	27	28	121
Sulphate (10%)	27	28	121
Complex (70%)	191	193	849
- Pesticides	111	113	704
- Herbicides	5	5	30
- Rodenticides	0	0	76
- Other			
Sacks	120	120	240
Shed	0	0	50
Equipment Hire	0	0	30
Tools	0	0	30
Fencing	0	0	20
7. Interest			
- Loan Repayment	112	114	114
- Other Charges	350	350	396
- Land Tax	89	90	90
8. Total Production Cost	1,169	1,180	3,179
9. Net Farm Income	7,098	7,325	14,383
10. Cash Income			
- Crop	3,379	3,418	7,743
- Livestock	90	240	1,880
- Fisheries	-	-	-
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	6,699	6,888	12,853
12. Cash Expenditure			
- Crop	1,169	1,180	3,179
- Livestock	300	400	1,000
- Fisheries	-	-	-
- Other	5,230	5,323	6,916
13. Total Cash Expenditure	6,699	6,903	11,095
14. Family Cash Balance	0	Δ 15	1,758
Say	0	0	1,800

Table N.2.6. - Financial Analysis -

Area and Household Model: Paddy (Future Irrigated) (Tenant)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	1,191	1,191	3,746
- Livestocks	90	240	1,080
- Fisheries	-	-	-
2. Family Consumption			
- Crops	2,646	2,678	2,880
- Livestocks	1,634	1,670	2,615
- Fisheries	-	-	-
3. Seed	153	153	169
4. Payment to Land Owner	1,328	1,337	1,816
5. Farm Labor			
- Hired Human Labor	0	0	0
- Hired Animal Labor	20	21	27
6. Planting Material			
- Planting Materials	-	-	-
- Fertilizer			
Urea (10%)	7	7	47
Phosphate (10%)	7	7	47
Sulphate (10%)	7	7	47
Complex (70%)	49	50	330
- Pesticides	40	40	303
- Herbicides	0	0	10
- Rodenticides	0	0	37
- Other			
Sacks	40	40	110
Shed	0	0	35
Equipment Hire	0	0	15
Tools	0	0	25
Fencing	0	0	15
7. Interest			
- Loan Repayment	0	0	0
- Other Charges	700	700	0
- Land Tax	0	0	0
8. Total Production Cost	870	872	1,048
9. Net Farm Income	4,844	5,060	9,442
10. Cash Income			
- Crop	1,191	1,191	3,746
- Livestock	90	240	1,080
- Fisheries	-	-	-
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	4,511	4,661	8,056
12. Cash Expenditure			
- Crop	870	872	1,048
- Livestock	300	400	800
- Fisheries	-	-	-
- Other	3,346	3,449	5,807
13. Total Cash Expenditure	4,516	4,721	7,655
14. Family Cash Balance	Δ 5	Δ 60	401
Say	0	0	400

Table N.2.7. - Financial Analysis -

Area and Household Model: Corn (Owner-cultivator)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	9,219	9,967	15,111
- Livestocks	3,320	3,470	6,890
- Fisheries	-	-	3,600
2. Family Consumption			
- Crops	2,975	2,975	3,212
- Livestocks	2,848	2,920	11,900
- Fisheries	-	-	900
3. Seed	242	261	293
4. Payment to Land Owner	-	-	-
5. Farm Labor			
- Hired Human Labor	126	136	157
- Hired Animal Labor	54	58	67
6. Planting Material			
- Planting Materials	100	100	150
- Fertilizer			
Urea (10%)	105	109	168
Phosphate (10%)	105	109	168
Sulphate (10%)	105	109	168
Complex (70%)	732	760	1,177
- Pesticides	351	371	822
- Herbicides	18	18	9
- Rodenticides	0	0	126
- Other			
Sacks	345	370	475
Shed	0	0	175
Equipment Hire	0	0	20
Tools	0	0	50
Fencing	0	0	30
7.Interest			
- Loan Repayment	233	242	242
- Other Charges	0	0	416
- Land Tax	248	260	260
8. Total Production Cost	2,522	2,642	4,580
9. Net Farm Income	16,082	16,951	37,326
10. Cash Income			
- Crop	9,219	9,967	15,111
- Livestock	3,320	3,470	6,890
- Fisheries	-	-	3,600
- Off-farm	960	960	960
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	16,249	17,147	29,311
12. Cash Expenditure			
- Crop	2,522	2,642	4,580
- Livestock	500	500	1,500
- Fisheries	-	-	2,100
- Other	12,993	12,839	7,693
13. Total Cash Expenditure	16,015	15,981	15,873
14. Family Cash Balance	234	1,166	13,438
Say	200	1,100	13,400

Table N.2.8. - Financial Analysis -
Area and Household Model: Corn (Part-owner)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	5,431	6,043	10,260
- Livestocks	90	240	1,880
- Fisheries	-	-	1,820
2. Family Consumption			
- Crops	2,809	2,957	3,212
- Livestocks	1,634	1,670	3,815
- Fisheries	-	-	440
3. Seed	232	251	283
4. Payment to Land Owner	1,532	1,645	2,429
5. Farm Labor			
- Hired Human Labor	54	59	61
- Hired Animal Labor	46	50	53
6. Planting Material			
- Planting Materials	50	50	100
- Fertilizer			
Urea (10%)	60	63	109
Phosphate (10%)	60	63	109
Sulphate (10%)	60	63	109
Complex (70%)	419	442	765
- Pesticides	219	235	584
- Herbicides	10	10	8
- Rodenticides	0	0	107
- Other			
Sacks	230	250	350
Shed	0	0	50
Equipment Hire	0	0	30
Tools	0	0	30
Fencing	0	0	20
7. Interest			
- Loan Repayment	157	165	165
- Other Charges	350	350	293
- Land Tax	172	183	183
8. Total Production Cost	1,887	1,983	3,126
9. Net Farm Income	8,309	9,178	18,584
10. Cash Income			
- Crop	5,431	6,043	10,260
- Livestock	90	240	1,880
- Fisheries	-	-	1,820
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	8,751	9,513	17,190
12. Cash Expenditure			
- Crop	1,887	1,983	3,126
- Livestock	300	400	1,000
- Fisheries	-	-	1,050
- Other	6,543	7,130	7,852
13. Total Cash Expenditure	8,730	9,513	13,028
14. Family Cash Balance	21	0	4,162
Say	0	0	4,100

Table N-2.9. - Financial Analysis -

Area and Household Model: Corn (Tenant)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	2,123	2,272	4,030
- Livestocks	90	240	1,080
- Fisheries	-	-	600
2. Family Consumption			
- Crops	2,102	2,198	2,685
- Livestocks	1,634	1,670	2,615
- Fisheries	-	-	160
3. Seed	125	153	172
4. Payment to Land Owner	1,215	1,548	2,326
5. Farm Labor			
- Hired Human Labor	0	0	0
- Hired Animal Labor	26	28	32
6. Planting Material			
- Planting Materials	-	-	-
- Fertilizer			
Urea (10%)	20	21	38
Phosphate (10%)	20	21	38
Sulphate (10%)	20	21	38
Complex (70%)	138	146	269
- Pesticides	74	80	206
- Herbicides	3	3	3
- Rodenticides	0	0	30
- Other			
Sacks	95	105	150
Shed	0	0	35
Equipment Hire	0	0	15
Tools	0	0	25
Fencing	0	0	15
7.Interest			
- Loan Repayment	0	0	0
- Other Charges	700	700	0
- Land Tax	0	0	0
8. Total Production Cost	1,096	1,125	894
9. Net Farm Income	4,978	5,408	10,448
10. Cash Income			
- Crop	2,123	2,272	4,030
- Livestock	90	240	1,080
- Fisheries	-	-	600
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	5,443	5,742	8,940
12. Cash Expenditure			
- Crop	1,096	1,125	894
- Livestock	300	400	800
- Fisheries	-	-	350
- Other	4,049	4,209	6,584
13. Total Cash Expenditure	5,445	5,734	8,628
14. Family Cash Balance	Δ 2	8	312
Say	0	0	300

Table N.2.10. - Financial Analysis -

Area and Household Model: Coconut (Owner-cultivator)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	12,383	14,314	31,931
- Livestocks	3,320	3,470	6,890
- Fisheries	-	-	-
2. Family Consumption			
- Crops	1,519	1,519	2,471
- Livestocks	2,848	2,920	11,900
- Fisheries	-	-	-
3. Seed	245	274	315
4. Payment to Land Owner	-	-	-
5. Farm Labor			
- Hired Human Labor	176	205	289
- Hired Animal Labor	75	88	124
6. Planting Material			
- Planting Materials	100	100	150
- Fertilizer			
Urea (10%)	72	75	253
Phosphate (10%)	72	75	253
Sulphate (10%)	72	75	253
Complex (70%)	506	526	1,773
- Pesticides	238	251	1,108
- Herbicides	18	18	135
- Rodenticides	77	77	668
- Other			
Sacks	380	430	790
Shed	0	0	75
Equipment Hire	0	0	20
Tools	0	0	50
Fencing	0	0	30
7. Interest			
- Loan Repayment	335	385	385
- Other Charges	0	0	758
- Land Tax	405	474	474
8. Total Production Cost	2,526	2,779	7,588
9. Net Farm Income	17,789	19,718	45,919
10. Cash Income			
- Crop	12,383	14,314	31,931
- Livestock	3,320	3,470	6,890
- Fisheries	-	-	-
- Off-farm	960	960	960
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	19,413	21,494	42,531
12. Cash Expenditure			
- Crop	2,526	2,779	7,588
- Livestock	500	500	1,000
- Fisheries	-	-	-
- Other	15,937	17,229	11,615
13. Total Cash Expenditure	18,963	20,508	20,203
14. Family Cash Balance	450	986	22,328
Say	400	900	22,300

Table N.2.11. - Financial Analysis -

Area and Household Model: Coconut (Part-owner)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	6,711	8,229	19,288
- Livestocks	90	240	1,880
- Fisheries	-	-	-
2. Family Consumption			
- Crops	1,184	1,184	1,710
- Livestocks	1,634	1,670	3,815
- Fisheries	-	-	-
3. Seed	162	185	217
4. Payment to Land Owner	1,430	1,662	3,742
5. Farm Labor			
- Hired Human Labor	59	71	94
- Hired Animal Labor	50	61	80
6. Planting Material			
- Planting Materials	50	50	100
- Fertilizer			
Urea (10%)	45	53	142
Phosphate (10%)	45	53	142
Sulphate (10%)	45	53	142
Complex (70%)	315	370	997
- Pesticides	146	154	592
- Herbicides	10	10	50
- Rodenticides	33	33	388
- Other			
Sacks	215	250	495
Shed	0	0	50
Equipment Hire	0	0	30
Tools	0	0	30
Fencing	0	0	20
7. Interest			
- Loan Repayment	191	250	250
- Other Charges	350	350	442
- Land Tax	236	276	276
8. Total Production Cost	1,790	2,034	4,320
9. Net Farm Income	7,991	9,474	22,590
10. Cash Income			
- Crop	6,711	8,229	19,288
- Livestock	90	240	1,880
- Fisheries	-	-	-
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	10,031	11,699	24,398
12. Cash Expenditure			
- Crop	1,790	2,034	4,320
- Livestock	300	400	1,000
- Fisheries	-	-	-
- Other	8,027	9,268	12,724
13. Total Cash Expenditure	10,117	11,702	18,044
14. Family Cash Balance	Δ 86	Δ 3	6,354
Say	0	0	6,300

Table N-2.12. - Financial Analysis -
Area and Household Model: Coconut (Tenant)

	Present Situation (1987)	Future Situation (1992)	
		Without Project	With Project
1. Market Production			
- Crops	4,477	5,295	13,635
- Livestocks	90	240	1,080
- Fisheries	-	-	-
2. Family Consumption			
- Crops	1,155	1,155	1,638
- Livestocks	1,634	1,670	2,615
- Fisheries	-	-	-
3. Seed	126	146	171
4. Payment to Land Owner	1,930	2,208	5,173
5. Farm Labor			
- Hired Human Labor	0	0	0
- Hired Animal Labor	41	48	64
6. Planting Material			
- Planting Materials	-	-	-
- Fertilizer			
Urea (10%)	22	23	70
Phosphate (10%)	22	23	70
Sulphate (10%)	22	23	70
Complex (70%)	151	158	489
- Pesticides	69	74	277
- Herbicides	6	6	29
- Rodenticides	19	19	176
- Other			
Sacks	140	165	350
Shed	0	0	35
Equipment Hire	0	0	15
Tools	0	0	25
Fencing	0	0	15
7. Interest			
- Loan Repayment	0	0	0
- Other Charges	700	700	0
- Land Tax	0	0	0
8. Total Production Cost	1,192	1,239	1,685
9. Net Farm Income	6,290	7,267	17,454
10. Cash Income			
- Crop	4,477	5,295	13,635
- Livestock	90	240	1,080
- Fisheries	-	-	-
- Off-farm	480	480	480
- Non-farm	2,750	2,750	2,750
11. Total Cash Income	7,797	8,765	17,945
12. Cash Expenditure			
- Crop	1,192	1,239	1,685
- Livestock	300	400	800
- Fisheries	-	-	-
- Other	6,346	7,128	13,610
13. Total Cash Expenditure	7,838	8,767	16,095
14. Family Cash Balance	Δ 41	Δ 2	1,850
Say	0	0	1,800

Table N.2.13

DEMAND AND VALUE OF RURAL UNSKILLED LABOR

Season	Present Situation		Future Situation			
			without project		with project	
	% of Total Annual Demand	Cost of Labor (P/md)	% of Total Annual Demand	Cost of Labor (P/md)	% of Total Annual Demand	Cost of Labor (P/md)
Peak	10	35	10	35	30	35
Slack	50	25	50	25	45	25
Minimum	40	10	40	10	25	10
Total/ Weighted Average	100 %	20.00	100 %	20.00	100 %	24.25

** ₱ 20.00 and ₱ 24.25 of financial costs are adjusted to ₱ 16.40 (the present situation), ₱ 16.40 (the future w/o situation) and ₱ 19.89 (the future w/ situation) of shadow wage rates using the standard conversion factor of 0.82.

Table N.2.14

Conversion Factors used in Economic Analysis

Goods and Services	World Bank/1	ADB/2	Consultants' Estimates
Standard Conversion Factor	0.86	0.66	0.82
Group Conversion Factors			
Capital Goods	0.86	0.75 /3	0.85
Utilities	0.80	0.64 /4	0.70
Transport	0.80	0.62 /5	0.78
Construction	0.84	0.60	0.80
Consumption	0.85	n.a.	-
Specific Conversion Factors			
Skilled Labor	n.a.	0.66	0.70
Urban Unskilled Labor	n.a. /6	0.64	0.65
Rural Unskilled Labor	n.a. /6	0.38	0.40
Consumption - Urban High Income	n.a.	0.66	0.70
- Urban Low Income	n.a.	0.64	0.65
- Rural	n.a.	0.64	0.65

n.a. = not available

Note: The conversion factors are applied to costs of producing goods and services (not tariffs in the case of utilities and transport). Wherever possible the operating costs are segregated into category costs to enable application of speific conversion factors to local cost items.

/1 -- Factors forwarded to ADB (Programs Department) by World Bank in 1925. No details provided as to methodology used for estimates but indications are that estimates are for 1983.

/2 -- "Draft Working Papers on Estimating Accounting Prices for Project Appraisal in the Philippines." Economics Office, ADB, March 1987. "Efficiency", Little Mirrless, Squire-van de Tak (LMST) accouting prices for Philippine economy using the Semi Input-Output Table methodology. Based on 66 x 66 1983 Input-Output Table for the Philippines from NCSO, Manila.

/3 -- Average for metal products, machinery, and electrical and transport equipment.

/4 -- Average for electricity and water.

/5 -- Average for buslines, jeepneys, road freight and shipping.

/6 -- Shadow wage rates of ₱17.10 and ₱11.80 per day for urban and rural unskilled labor in 1983, respectively.

Table N.2.15
Financial and Economic Costs of Crop Inputs

-Unit: Pesos -

Crop Input	Unit	Financial			Economic		
		1987	1992	2000	1987	1992	2000
Human Labor 1/	md	35.00	35.00	35.00			
Animal Labor	ad	25.00	25.00	25.00	25.00	25.00	25.00
Tractor Labor		150.00	150.00	150.00	150.00	150.00	150.00
Support Frees	no.	2.00	2.00	2.00	2.00	2.00	2.00
Planting Materials							
Palay	kg.	6.00	6.00	6.00	6.00	6.00	6.00
Corn	kg.	35.00	35.00	35.00	35.00	35.00	35.00
Coconut	no.	3.00	3.00	3.00	3.00	3.00	3.00
Abaca	no.	1.00	1.00	1.00	1.00	1.00	1.00
Cassava/Gabi	no.	0.50	0.50	0.50	0.50	0.50	0.50
Mongo bean	kg.	20.00	20.00	20.00	20.00	20.00	20.00
Vegetable	gr.	0.60	0.60	0.60	0.60	0.60	0.60
Black Pepper	no.	2.50	2.50	2.50	2.50	2.50	2.50
Peanut -	kg.	24.00	24.00	24.00	24.00	24.00	24.00
Sweet Potato	no.	0.10	0.10	0.10	0.10	0.10	0.10
Pilinut	no.	4.00	4.00	4.00	4.00	4.00	4.00
Manure	mt	200.00	200.00	200.00	200.00	200.00	200.00
Urea (46-0-0)	50kg	215.00	215.00	215.00	215.00	215.00	215.00
Posphate	50kg	242.00	242.00	242.00	242.00	242.00	242.00
Potash	50kg	190.00	190.00	190.00	190.00	190.00	190.00
Complete(14-14-14)	50kg	245.00	245.00	245.00	245.00	245.00	245.00
Sacks	pc	5.00	5.00	5.00	5.00	5.00	5.00
Shed	pc	15.00	15.00	15.00	15.00	15.00	15.00
Chemical 2/	liter						
Others 2/							

1/ Refer to Table N.2.13 for economic costs of human labor.

2/ Economic costs of chemicals and other inputs are valued at financial costs.

Table N.2.16
FINANCIAL AND ECONOMIC PRICES OF CROP OUTPUT
-Unit:Pesos-

Crop Output	Unit	Financial			Economic		
		1987	1992	2000	1987	1992	2000
Paddy	kg	3.00	3.30	3.60	2.66	2.95	3.28
Corn	kg	2.30	2.60	3.00	2.65	3.04	3.60
Coconut (Copra)	kg	5.50	5.50	5.50	6.00	7.05	7.45
Abaca	kg	7.35	7.35	7.35	14.20	15.02	12.30
Cassava/Gabi	kg	2.50	2.50	2.50	2.50	2.50	2.50
Mongo Bean	kg	11.00	11.00	11.00	11.00	11.00	11.00
Vegetable (Green Leafy)	kg	5.00	5.00	5.00	3.00	3.00	3.00
Black Pepper	kg	140.00	140.00	140.00	82.94	72.44	89.04
Peanut	kg	9.00	9.00	9.00	9.00	9.00	9.00
Sweet Potato	kg	8.00	8.00	8.00	2.00	2.00	2.00
Pili Nut	kg	13.00	13.00	13.00	13.00	13.00	13.00
Upland Rice	kg	7.00	7.30	7.60	7.00	7.30	7.60

Table N.2.17 Water Charge Calculation Sheet

Priority Project	(1) Service Population	(2) 1/ No. of Families	(3) 2/ Water Demand per family per month	(4) Development Cost ('000 pesos)	(5) O & M Cost ('000 pesos)	(6) 3/ Annual Repayment ('000 pesos)	(7) 4/ Monthly Repayment per Family (pesos)	(8) 5/ Water Charge (Pesos/Gal.)
Calbayog	120,000	22,222	1,125	154,840	2,520	18,391	69	0.06
San Jorge - Gandara	33,000	6,111	1,125	68,000	700	7,670	105	0.09
Calbiga	12,400	2,296	1,125	29,100	280	3,263	118	0.10
Pinabacdao	3,100	574	1,125	12,780	196	1,506	218	0.19
Basey	17,300	3,204	1,125	70,500	700	7,926	206	0.18
Catbalogan	119,000	22,307	1,125	201,140	2,520	23,137	86	0.07

Notes: 1/ Average family member 5.4/family was applied.
2/ 150 liters/day x 30 days ÷ 4 liters/gallon = 1,125 gallon.
3/ Ten percent of annual interest and three years grace period was considered. Disbursement period is from 4th year to 23rd year (20 years).
4/ (7) = (6) ÷ (2) ÷ 12
5/ (8) = (7) ÷ (3)

Table N.2.18 Calculation Sheet of Economic Internal Rate of Return (E.I.R.R.)
- Mini Hydro Power Project -

	(1) Max (kw)	(2) Output Firm (kw)	(3) Annual Generated Energy (MWH)	(4) = (1) x 11 Economic Cost for the Construction of the diesel plant ('000 pesos)	(5) = (4) x 2% Economic Cost for Operation and Maintenance ('000 pesos)	(6)=(3)x0.256 Annual Fuel Requirement ('000 liters)	(7)=(6)x3.1 Annual Fuel Cost ('000 pesos)
1. Bugtant	1,800	210	4,820	19,800	396	1,234	3,825
2. Tabukumo	60	14	298	660	13	76	236
3. Malaung	115	25	572	1,265	25	146	453
4. Matsuguinao	350	76	1,714	3,850	77	439	1,361
5. Malapgap	180	40	876	1,980	40	224	694
6. Matatud	105	21	512	1,155	23	131	406
7. Blanca R.	2,450	525	10,710	26,950	539	2,742	8,500
8. Aurora F.	29	6	143	319	6	37	115
9. Tangbong	235	50	1,145	2,585	52	293	908
10. Heruando	380	84	1,856	4,180	84	475	1,473
11. Tagaoyang R.	154	34	780	1,694	34	200	620
12. Ulot R.	3,780	630	14,280	41,580	837	3,656	11,334
13. Calbiga	1,370	294	6,664	15,070	301	1,706	5,289
14. Sohoton R.	2,695	578	13,090	29,645	593	3,351	10,388
15. Burgos	410	92	1,999	4,510	90	512	1,587
16. Ford	360	78	1,749	3,960	79	448	1,389

- Continued

	(8)=(7)x0.045 Lubricating Oil Cost ('000 pesos)	(9)=(4)x0.1174 Amortization of Initial Investment Costs ('000 pesos)	(10)=(5)+(7)+(8)+(9) Total Benefit ('000 pesos)	Economic Investment Costs ('000 pesos)	Economic O/M Cost ('000 pesos)	Economic Internal Rate of Return (EIRR)
1. Bugtant	172	2,325	6,718	39,524	1,328	9 %
2. Tabukumo	11	77	337	5,051	44	2 %
3. Malaung	20	149	647	6,527	89	5 %
4. Matsuguinao	61	452	1,951	11,447	258	10 %
5. Malapgap	31	232	997	7,872	133	7 %
6. Matatud	18	136	583	6,257	81	5 %
7. Blanca R.	383	3,164	12,586	57,444	1,845	13 %
8. Aurora F.	5	37	163	4,264	22	less 1 %
9. Tangbong	41	303	1,304	9,553	185	8 %
10. Heruando	66	491	2,114	12,300	295	10 %
11. Tagaoyang R.	28	199	881	7,429	118	16 %
12. Ulot R.	510	4,881	17,562	83,312	2,804	12 %
13. Calbiga	238	1,769	7,597	30,668	1,033	15 %
14. Sohoton R.	467	3,480	14,928	62,812	1,993	14 %
15. Burgos	71	529	2,277	12,546	295	11 %
16. Ford	63	465	1,996	11,218	266	11 %

Table N.2.19 Annual Job Creation by Sector in 1992, 1997 and 2007

Sector	End of Short-Term (1992) (man-year)	End of Medium-Term (1997) (man-year)	End of Long Term (2007) (man-year)
Primary Sector (Agriculture, Forestry and Fisheries (excluding marine fisheries))	630	2,150	2,150
Secondary Sector (Construction)	3,040	2,790	3,140
Tertiary Sector (Operation and Maintenance Service)	910	480	470
Total	4,580	5,420	5,760

Note: Number of job creation does not include private investments

Figure N.2.1
THE ECONOMIC INTERNAL RATE OF RETURN (EIRR)
FOR IRRIGATION PROJECT

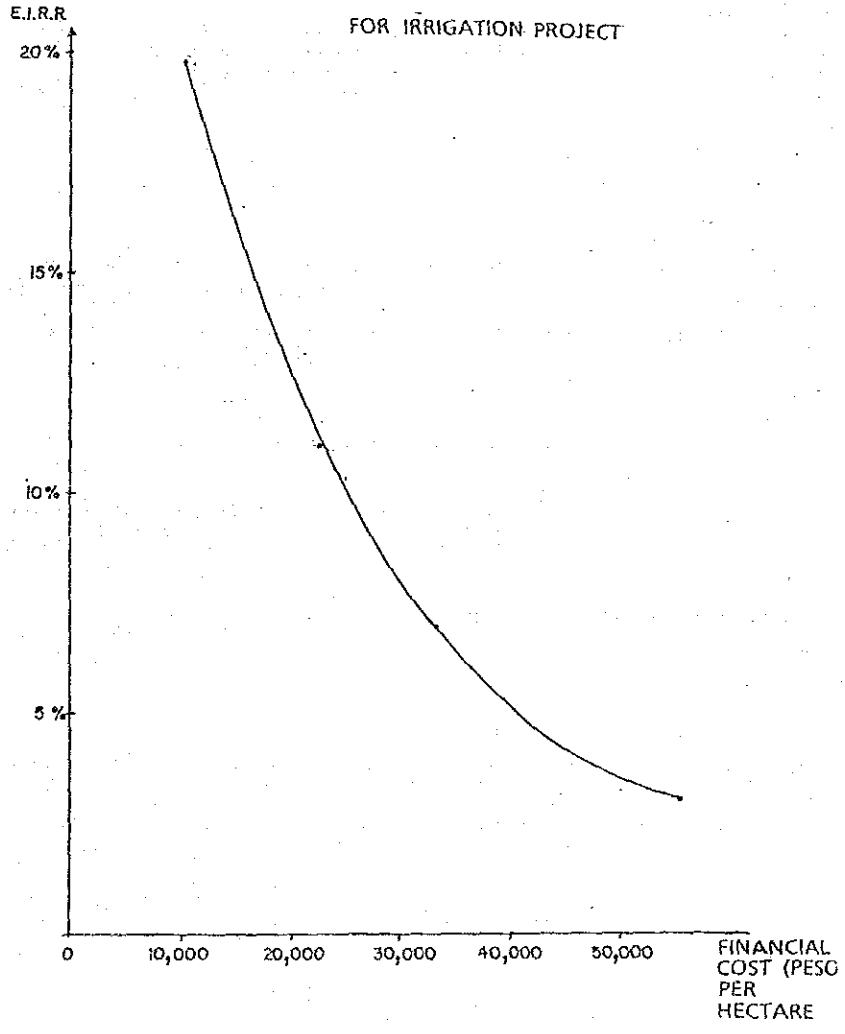
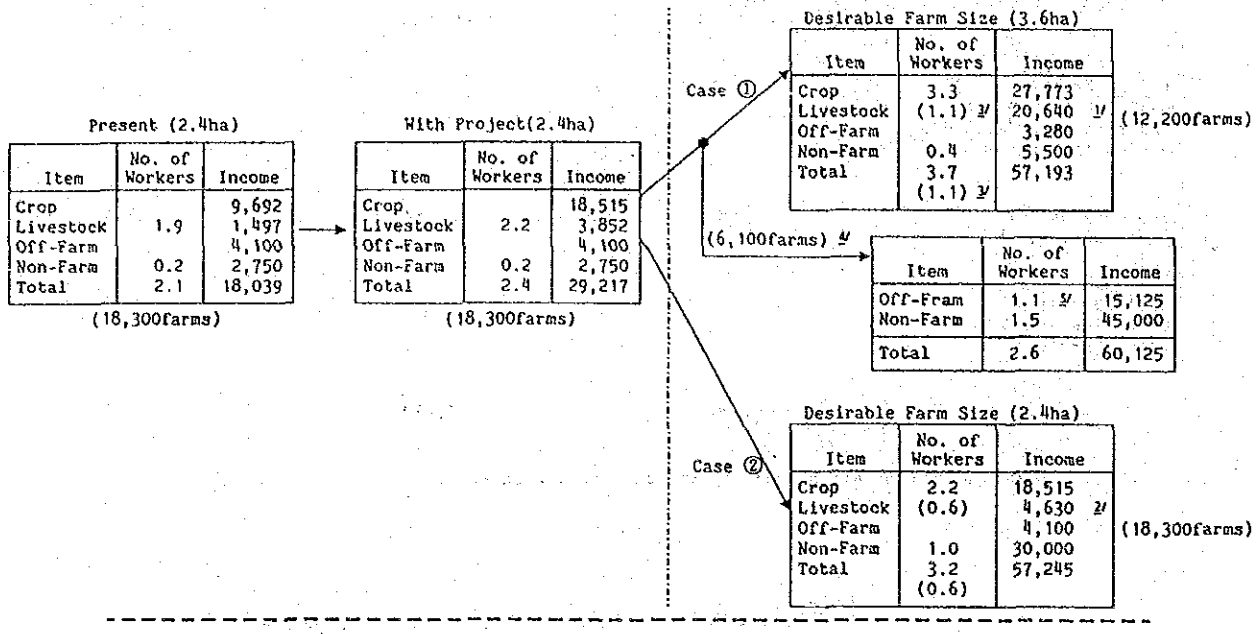


Figure N.2.2 Desirable Farming Pattern for Paddy Production Farmer



Available Workers per Family
2.5person/family → 2.7 person/family
underemployment 7% → 1% 7/
Unemployment 9% → 4% 6/
Percentage of Worker → 2.7 x 95% = 2.6 person

$\frac{2.1}{2.5}$ =84%

Note; (1) 1/ Desirable number of livestocks are as follows; Carabao 2 heads, Cattle 2 head, Goat 5 head
Swine 7 heads, Chicken 10 heads, Duck 7 heads

2/ Desirable number of livestocks are as follows; Carabao 1 head, Swine 4 heads,
Chicken 10 heads

3/ Figures in parenthesis ( ) are the number of hired labor.

4/ 6,100 farms would be desirable to enter into secondary and tertiary sector for expansion of average farm size to 3.6 ha.

5/ Number of the off-farm workers per family among 6,100 farms mentioned above are expected at 1.1 persons/family, which can be absorbed as the required hired rabor by the expanded land owners.

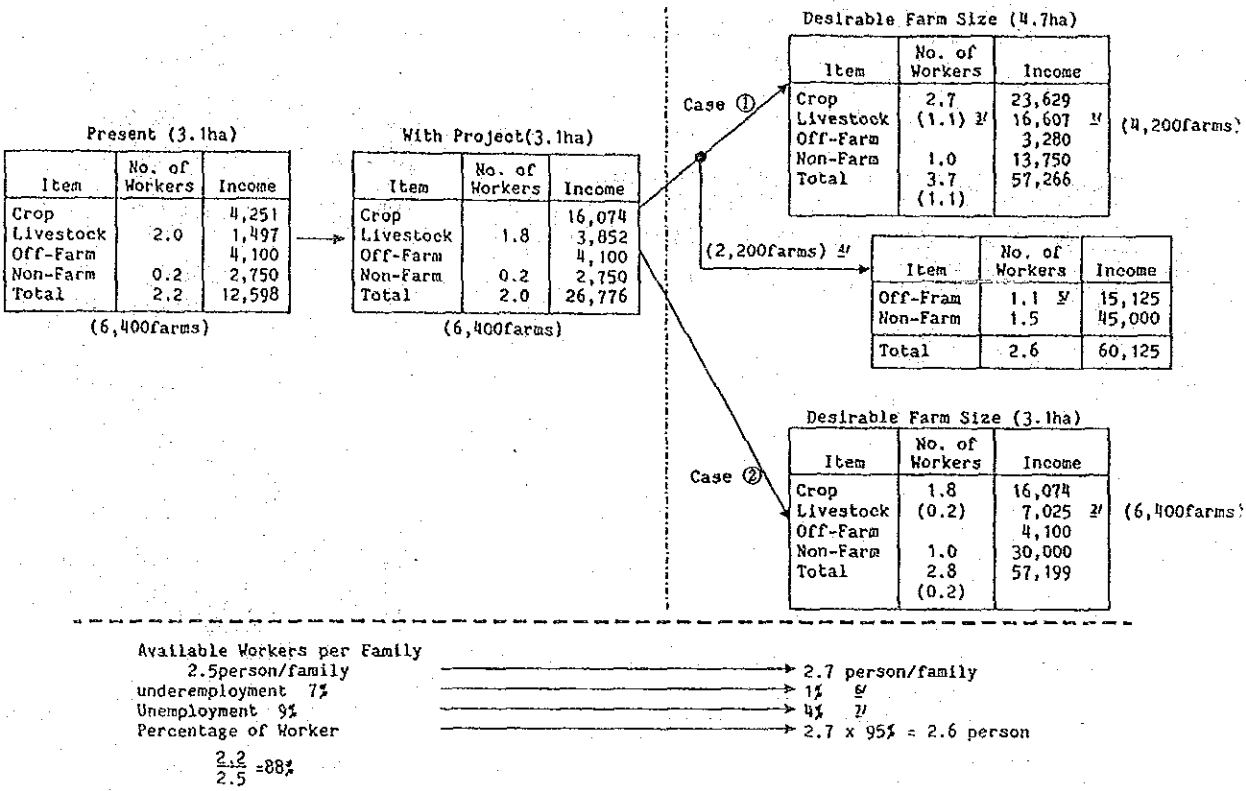
6/ Declining the percentage for unemployment from 9 to 4% is the target of long term development stage.

7/ Assumed.

(2) Number of workers in present condition are applied from the result of farm economy survey, and in with project condition are computed as follows;

110 x 2 x 2.4 ÷ 240 = 2.2 where ; 110 Labor requirment per hectare with project condition
2 two seasons (wet and dry)
2.4 hectare
240 Average working days per capita

Figure N.2.3 Desirable Farming Pattern for Corn Production Farmer



Available Workers per Family
2.5person/family → 2.7 person/family
underemployment 7% → 1% 6/
Unemployment 9% → 4% 7/
Percentage of Worker → 2.7 x 95% = 2.6 person

$\frac{2.2}{2.5}$ =88%

Note; (1) 1/ Desirable number of livestocks are as follows; Carabao 2 heads, Cattle 2 heads, Goat 3 heads Swine 4 heads, Chicken 8 heads, Duck 2 heads

2/ Desirable number of livestocks are as follows; Carabao 1 head, Cattle 1 head, Goat 1 head Swine 1 head, Chicken 4 heads

3/ Figures in parenthesis ( ) are the number of hired labor.

4/ 2,200 farms would be desirable to enter into secondary and tertiary sector for expansion of average farm size to 4.7 ha.

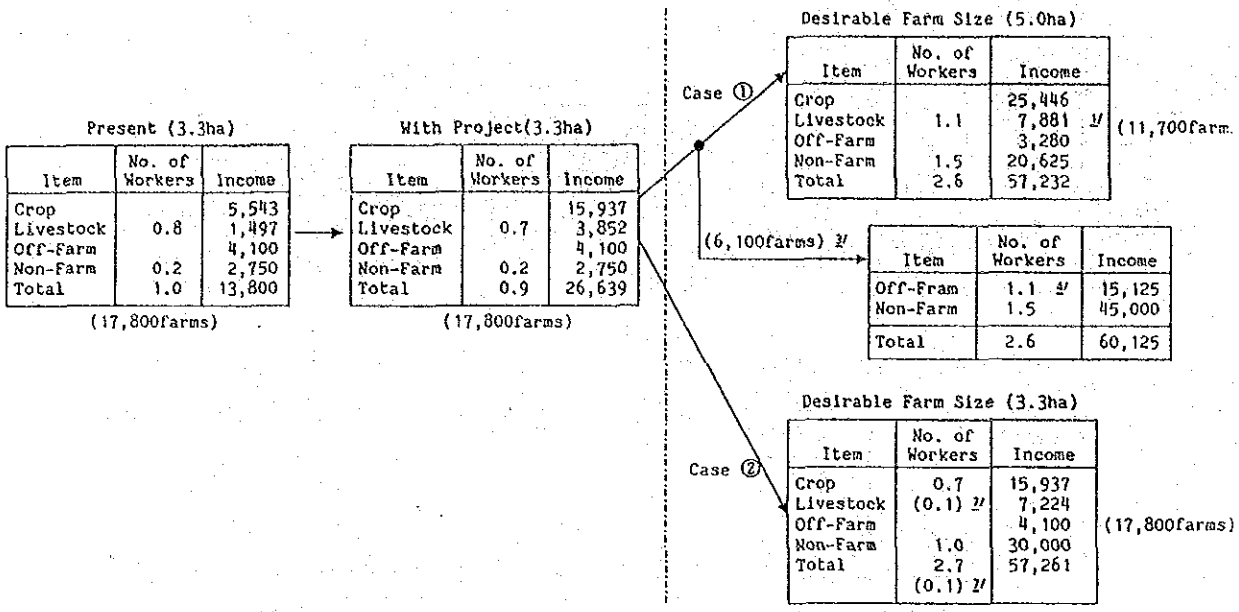
5/ Number of the off-farm workers per family among 2,200 farms mentioned above are expected at 1.1 persons/family, which can be absorbed as the required hired labor by the expanded land owners.

6/ Assumed.

7/ Declining the percentage for unemployment from 9 to 4% is the target of long term development stage.

(2) Number of workers in present condition are applied from the result of farm economy survey, and in with project condition are computed as same way as paddy production. (refer to Figure N.2.2)

Figure N.2.4 Desirable Farming Pattern for Coconut Production Farmer



Available Workers per Family
2.5person/family → 2.7 person/family
underemployment 7% → 1% 5/
Unemployment 9% → 4% 6/
Percentage of Worker → 2.7 x 95% = 2.6 person

$\frac{1.0}{2.5}$ =40%

Note; (1) 1/ Desairable number of livestocks are as follows; Carabao 1 head, Cattle 1 head, Goat 2 heads, Swine 1 head, Chicken 7 heads

2/ Desairable number of livestocks are as follows; Carabao 1 head, Goat 4 heads, Swine 4 heads, Chicken 4 heads, Duck 1 head

3/ 6,100 farms would be desirable to enter into secondary and tertiary sector for expansion of average farm size to 5.0 ha.

4/ Number of the off-farm workers per family among 6,100 farms mentioned above are expected at 1.1 persons/family, which can be absorbed as the required hired rabor by the expanded land owners.

5/ Assumed.

6/ Declining the percentage for unemployment from 9 to 4% is the target of long term development stage.

7/ Figures in parenthesis ( ) are the number of hired labor.

(2) Number of workers in present condition are applied from the result of farm economy survey, and in with project condition are computed as same way as paddy production. (refer to Figure N.2.2)