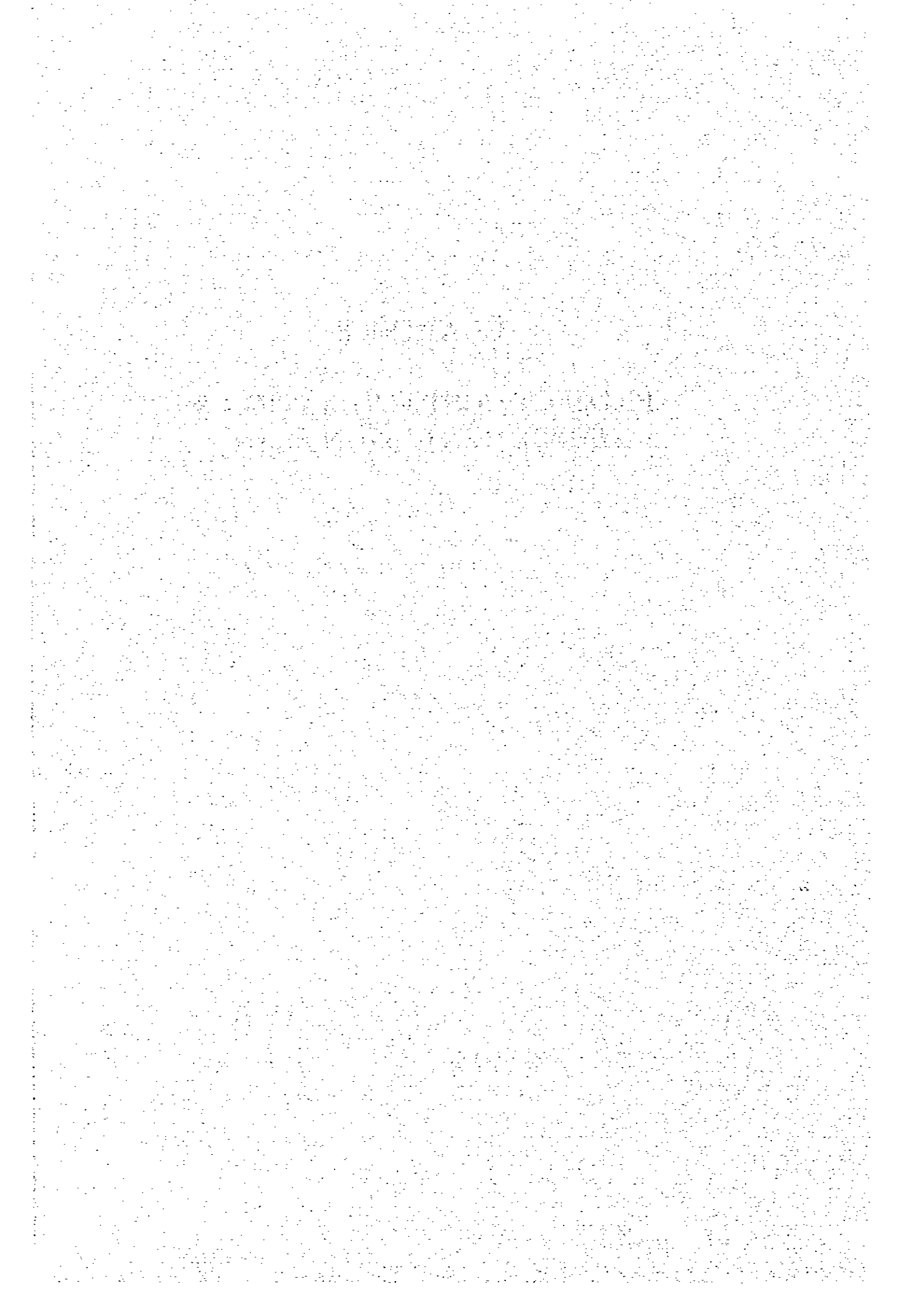


CHAPTER 8

PROJECT COST ESTIMATION & IMPLEMENTATION PLAN



CHAPTER 8 PROJECT COST ESTIMATION & IMPLEMENTATION PLAN

8.1 Project Plan

8.1.1 Overall Project Plan

The project plans are largely divided into the basin conservation plan, the agricultural development plan, and the agricultural support group and farmers' organization plan. These plans shall require the same facilities and O&M equipment and materials. The outline of the overall project plan is shown in Table 8.1.1.1.

8.1.2 Model Project Plan

The model project shall entail basin conservation, agricultural development, and the formulation and reinforcement of agricultural support groups and farmers' organizations. These model projects shall require the same facilities. Table 8.1.1.2 shows the outline of the model projects.

8.2 Project Cost Estimation

8.2.1 Basic Conditions for Project Cost Estimation

The project cost was calculated under the following basic conditions in accordance with the field survey results:

- 1) The exchange rate adopted for the calculation was the November 1996 rate of US\$1.0 = ₪8.7 = ¥113.20.
- 2) Construction materials and equipment available in the study area were procured therein. In case a concrete stone block is to be used, a different consideration shall be adopted.
- 3) The O&M equipment and materials obtainable in the study area, which are also of good quality and in accordance with the specifications, shall be purchased therein.

8.2.2 Overall Project Cost

(1) Project Cost

The overall cost of the project is estimated at US\$485,500,000 (¥54,958,600,000), and the breakdown is shown below.

Overall Project Costs

<i>Items</i>	<i>Local Currency</i>	<i>Foreign Currency</i>	<i>Total (US\$1,000)</i>
a. Facility Construction Cost	360,560	34,777	395,337
b. Equipment and Materials Procurement Cost	2,847	7,209	10,056
c. Design Supervision Cost (c = a × 10%)	11,860	27,673	39,533
d. Land Acquisition Cost	36	0	36
e. Contingency Cost (f = (a + b) × 10%)	32,430	8,108	40,538
Total	407,733	77,767	485,500

1) Project Facilities Construction Cost and Material Procurement Cost

The construction cost (a) and the procurement cost (b) is estimated to total US\$405,393,000. Accordingly, the integrated agricultural development project shall consist of a basin conservation plan, an agricultural development plan, and the agricultural support group and farmers' organization plan (see Table 8.2.2.1).

2) Design Supervision Cost

The design supervision cost is estimated to arrive at US\$39,533,000, assuming that it is 10% of the construction cost.

3) Land Acquisition Cost

This cost refers to the total cost for the acquisition of lands necessary for the conduct of the project, and is therefore estimated at US\$36,000. Although a part of the land to be purchased is located at the outskirts of the urban area, because of the topography of the study area, the land price was set at US\$450/ha.

4) Contingency Cost

The contingency cost shall be 10% of the total construction cost (a) and material procurement cost (b), and is estimated at US\$40,538,000.

(2) Model Project Cost

Of the overall project cost, US\$15,003,000 shall be allocated for the conduct of model projects (see Table 8.2.2.2). The total cost for the construction and procurement of model project facilities is estimated at US\$12,993,000.

The project design supervision, land acquisition and contingency costs are estimated at US\$708,000, US\$2,000, and US\$1,300,000, respectively. The detailed estimations of the overall project cost (facility and material construction and procurement) and the model project cost (facility and material construction and procurement) are shown in the Annex.

8.3 Project Implementation Plan

To smoothly conduct the overall development works, the implementation shall be carried out in three phases. The implementation of this project is considered to take a total of 14 years (1997 - 2010). Table 8.3.1 shows the proposed project implementation plan.

- | | |
|--------------------------|--|
| Phase I (1997 - 1998): | implementation of the prioritized 13 model projects; |
| Phase II (1999 - 2005): | improvement of the socioeconomic conditions of the farmers benefiting from the project, and implementation of the 6 plans considered to have tangible benefits |
| Phase III (2005 - 2010): | implementation of 1 plan. |

Table 3. 1. 1. 1 OVERALL PROJECT OUTLINE

	Unit	Qty	OUTLINE OF FACILITIES	OUTLINE OF MATERIALS
1. BASIC CONSERVATION PLAN				
(1) FLOOD CONTROL PLAN	km	15.5	Rehabilitate 12.5km in Jilim River, 3.0km in Somenon River (12.5km to the right, 15.0km to the left)	100 Equipment: 3 bulldozers, 3 backhoes, 3 excavators, and 3 shovels for embankment, 3 tractors, 9 heavy trucks
(2) FLOOD CONTROL FACILITIES PLAN	set	1	Elevated Toilet: 80 pieces; Increase wall concrete ceiling height to 4.0m; 80 pieces; elevated sanitary slates (200cm ²); 6 pieces	
(3) APPROPRIATION PLAN	pieces	1	Administrative Building (520m ²), animal feeding house, nursery (7,200m ²), irrigation facility (small, medium, water tank)	Personal computers, soil nutrients analysis instrument, seed thrasher, 50 nursery seedling cuttings, electric sewing tools, notebook, tape
(4) APPROPRIATION TECHNOLOGY DEVELOPMENT PLAN	#	1		20 sawers, 10 drillers, 50 drilling tools, 50 seedling bags, 50 sprayers, 500 500ml beer, 10 wheelbarrows, 100kg sawdust, triangular net, rectangular net, rectangular net, mesh, seals, trash sheet, wheelbarrow, personal computer, pickup truck, motorcycle
(5) SOIL CONSERVATION TECHNOLOGY DEVELOPMENT PLAN	#	1	Office (90m ²), improvement of existing demonstration farm	Bar (30 motorcycle capacity)
(6) SOIL CONSERVATION TECHNOLOGY EXTENSION PLAN	#	1	Hillside ditch (800m), repair of MG research laboratory, road construction	
(7) SAND DAM PLAN	#	10	Sand dam (embank): 10	
(8) INTEGRATED WATER MANAGEMENT PLAN	set	1	7 observation stations (7 sampling meteorological observation and 7 for water level survey), 1 meteorological observation station, meteorological station, 8 groundwater observation wells	Atmos observation spectrophotometer, nitrogen and organic analysis equipment, water distiller, personal computer, pump machine, pickup truck
2. AGRICULTURAL DEVELOPMENT PLAN				
(1) LIVESTOCK DEVELOPMENT PLAN	pieces	1	Pig sty (150m ²), paddock (750m ²), pig feed and water containers, system for urine and excreta	Pickup truck, 3 buckets
(2) POULTRY PRODUCTION PLAN	pieces	1	Penalty house (100m ²), electrical office (500m ²), water supply	Pickup truck, hammer mill, 3 buckets
(3) LIVESTOCK HEALTH SERVICES IMPROVEMENT PLAN	pieces	1	Office (90m ²), storage and equipment	Construction instrument: 5 immolation pens, large refrigerator, portable incubator (1 meter operated and 2 manual), medicine cabinet, pickup truck
(4) INLAND FISHERIES PLAN	pieces	1	Consolidation weir (1.8x15.0), 2 pens (concrete pens 200x15m), fishing pond (2,000m ²), office (200m ²)	5 motor nets, 10 woodblocks, motorcycle
(5) AGRICULTURAL INFRASTRUCTURE IMPROVEMENT PLAN	pieces	1	Approach road: 4.0m wide, 100m long; Farm road: 3.2m wide, 4,900m long; Hillside ditch (400m)	
(6) SLOPE FARMING PLAN	ha	2,100	51, 150m wide, 17, 100m wide, installation of generator in 60 pieces, 1 set of irrigation facilities	
(7) RURAL WATER SUPPLY FACILITIES CONSTRUCTION PLAN	ha	1,790	Transverse earth dam: 11,500m, 40m high, 40m wide; 12,200m; bridges: 2.0m wide, in 8 pieces	
(8) RURAL INFRASTRUCTURE IMPROVEMENT PLAN	ha	52.75	Demonstration farm road: 4.0m wide, 520,750m long	
(9) RURAL INFRASTRUCTURE IMPROVEMENT PLAN	pieces	40	Assembly area to be constructed in 40 pieces (20m ²)	
(10) RURAL WATER SUPPLY FACILITIES CONSTRUCTION PLAN	no. of wells	18, 870	Main water attachment, pumps (15, 870 pieces)	
(11) RURAL TOILETS CONSTRUCTION PLAN	#	14,242	Transferable toilet (14,242 pieces)	
(12) RURAL ROAD IMPROVEMENT PLAN	km	274	Three-class roads: 6.0 wide, 80.4km long; Rural A roads: 6.0m wide, 42.0km long; Rural B roads: 4.0m wide, 152.0km long	
3. AGRICULTURAL SUPPORTING GROUP-FAREER ORGANIZATION POPULATION PLAN				
(1) AGRICULTURAL SUPPORTING GROUP IMPROVEMENT PLAN	pieces	9	9 Offices (340m ²), 9 nurseries (50m ²), 9 outside drain	Wood tractor and trailer, small backhoe, small bulldozer, pickup truck, motorcycle, 9 sets of instruments for soil analysis
(2) PROJECT PROMOTION AND EXTENSION PLAN	#	1	Repair of MG research laboratory (as stated above), 25m ² storage, 30m ² nurseries, 200m ² equipment storage	Bulldozer, backhoe, tractor shovel, uriner, 2 portable stoves, workshop car, pickup truck, electric saw
(3) AGRICULTURAL PRODUCTS DISTRIBUTION STATION IMPROVEMENT PLAN	#	4	Collection and loading place and office (300m ²) in 4 pieces, open area for loading (4 pieces)	4 forklifts, 4 platform scales, 4 earthshakers, 4 31cm ² trucks, 4 aluminum, 4 pickup trucks, 4 tractors, 4 heavy machines

TABLE 8. 1. 1. 2 OUTLINE OF MODEL PROJECTS

	Unit	Qty	OUTLINE OF FACILITIES	OUTLINE OF EQUIPMENT
1. WATER CONSERVATION PLAN				
1) APPROPRIATE PLAN	pieces	1	Administration building (500 ²), screen testing house, nursery (7,200 ²), irrigation facilities (canals, pipelines, water tank)	Programs computer, soil nutrient analyzing instruments, road tractor, 40 capacity seedling containers, pickup truck, milling tools, woodwork tools
2) AGRICULTURAL TECHNOLOGY DEVELOPMENT PLAN	"	1	Office (500 ²), improvement of existing demonstration farm	
3) SOIL CONSERVATION TECHNOLOGY DEVELOPMENT PLAN	"	1	Rillside ditch (900 ²), repair of SAC research laboratory, road construction	20 tractors, 40 drills, 60 drilling tools, 50 seedling beds, 50 mulchings bags, 10 wheelbarrows, motorized saw, pickup trucks
4) SOIL CONSERVATION TECHNOLOGY EXTENSION PLAN	"	1		Van (20 passenger capacity)
5) IRRIGATED WATER MANAGEMENT PLAN				
6) INTERDISCIPLINARY-INTERAGENCY OPERATIONAL IMPROVEMENT PLAN	set	1	7 observation stations (7 combining meteorological observation and 7 for water level surveys), 1 relay observation station, analyzing station	Auto absorption spectrophotometer, beam and atomic analysis equipment, water analyzer, motor fan/tiler, permasprometer, crop machine, pickup truck
2. AGRICULTURAL DEVELOPMENT PROJECT				
LIVESTOCK DEVELOPMENT PLAN				
1) DAIRY PRODUCTION PLAN	pieces	1	Pasture (120 ²), paddock (60 ²), pig (pig and water container, system for urine and sterens)	Pickup truck, 3 buckets
2) MEATLIVY RABBITTING PLAN	pieces	1	Poultry house (100 ²), electrical wiring (2000 ²) water supply	Pickup truck, hammer mill, 3 buckets
3) LIVESTOCK HEALTH SERVICES IMPROVEMENT PLAN	pieces	1	Office (50 ²), storage cow stocks, incubator	Construction instruments, 3 inoculation pens, large refrigerator, portable sterilizer (1 power operated and 2 manual), vaccine cabinet, pickup truck
4) RABBIT FISHERIES EXTENSION PLAN				
5) ISLAND FISHERIES PLAN	pieces	1	Consolidation weir (1.5 x 15.0), 2 traps (automatic mesh 200/400), fishing boat (7,000 ²), office on storage (50 ²)	5 motor nets, 10 spearguns, 6 buckets, outboard
6) AGRICULTURAL REPAIR/CONSTRUCTING IMPROVEMENT PLAN	pieces	1	Approach road 4.0m wide, 100m long; farm road 1.2m wide, 4,000 long; rillside ditch (900 ²)	
7) BANQUE FISHING PLAN	ha	120	4 100m well, damwater installation in 4 places, 1 set of irrigation facilities	
8) CANAL/WATER IRRIGATION PLAN				
3. AGRICULTURAL SUPPORTING GROUP/FARMERS' ORGANIZATION POPULATION PROJECT				
AGRICULTURAL SUPPORTING GROUP IMPROVEMENT PLAN	pieces	9	3 Offices (500 ²), 3 garages, 3 200 warehouses, 3 outside drains	Used tractor and trailer, small tractors, small bulldozer, pickup truck, motorcycle, 3 sets of instruments for soil analysis
2) PROJECT PRODUCTION AND EXTENSION PLAN	"	1	Repair of SAC research laboratory (as stated above), storage (200 ²), 200 ² ; equipment storage	Bulldozer, bucket, tractor shovel, tractor, 2 portable saws, workshop set, pickup truck, motorcycle

TABLE 8.2.2.1 OVERALL PROJECT COST

US\$1,000

PROJECT	TOTAL
PROJECT COST	485,500
1. BASIN CONSERVATION PLAN	325,022
1) RIVER IMPROVEMENT PLAN	314,492
2) FLOOD CONTROL FACILITIES PLAN	1,324
3) AFFORESTATION TECHNOLOGY DEVELOPMENT	4,134
4) AFFORESTATION EXTENSION PLAN	175
5) SOIL CONSERVATION TECHNOLOGY	310
6) SOIL CONSERVATION TECHNOLOGY EXTENSION	246
7) SABO DAM PLAN	350
8) METEOROLOGICAL & HYDROLOGICAL SYSTEM IMPROVEMENT PLAN	3,981
2. AGRICULTURAL DEVELOPMENT PLAN	149,944
1) SWINE PRODUCTION PLAN	72
2) POULTRY FARMING PLAN	81
3) LIVESTOCK HEALTH SERVICES IMPROVEMENT PLAN	194
4) INLAND FISHERIES DEVELOPMENT PLAN	127
5) SLOPE FARMING PLAN	956
6) GROUNDWATER DEVELOPMENT PLAN (IRRIGATION USE)	21,625
7) FARMLAND DRAINAGE IMPROVEMENT PLAN	1,982
8) FARM ROADS IMPROVEMENT PLAN	1,643
9) MULTIPURPOSE BUILDING CONSTRUCTION PLAN	816
10) RURAL WATER SUPPLY FACILITIES CONSTRUCTION PLAN	8,904
11) RURAL SANITATION PLAN	636
12) RURAL ROADS IMPROVEMENT PLAN	112,908
3. AGRICULTURAL SUPPORT GROUP & FARMERS' ORGANIZATION	10,534
1) AGRICULTURAL EXTENSION OFFICES REINFORCEMENT PLAN	7,989
2) PROJECT PROMOTION AND EXTENSION PLAN	1,306
3) AGRICULTURAL DISTRIBUTION SYSTEM IMPROVEMENT PLAN	1,239

TABLE 8.2.2.2 MODEL PROJECT COST

US\$1,000

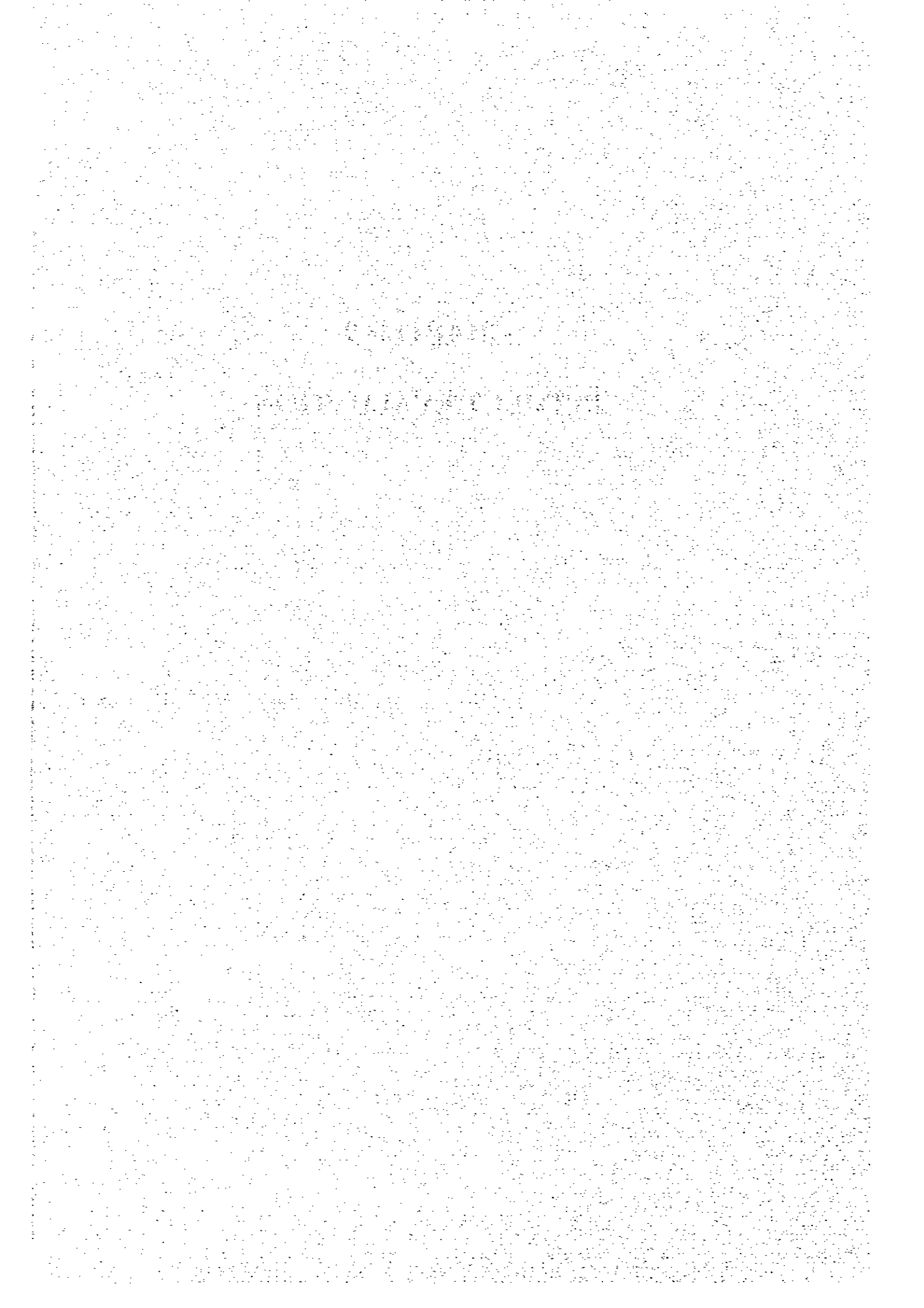
MODEL PROJECTS	LOCAL CURRENCY	FOREIGN CURRENCY	TOTAL
MODEL PROJECT COST	6,933	8,070	15,003
1. BASIN CONSERVATION PLAN	3,348	5,225	8,573
1) AFFORESTATION TECHNOLOGY DEVELOPMENT MODEL PROJECT	2,156	1,978	4,134
2) AFFORESTATION EXTENSION MODEL PROJECT	159	16	175
3) SOIL CONSERVATION TECHNOLOGY DEVELOPMENT MODEL PROJECT	191	119	310
4) SOIL CONSERVATION TECHNOLOGY EXTENSION MODEL PROJECT	185	61	246
5) METEOROLOGICAL & HYDROLOGICAL SYSTEM IMPROVEMENT MODEL PROJECT	657	3,051	3,708
2. AGRICULTURAL DEVELOPMENT MODEL PROJECT	1,915	787	2,702
1) SWINE PRODUCTION MODEL PROJECT	54	18	72
2) POULTRY FARMING MODEL PROJECT	55	26	81
3) LIVESTOCK HEALTH SERVICES IMPROVEMENT MODEL PROJECT	130	64	194
4) INLAND FISHERIES DEVELOPMENT MODEL PROJECT	85	42	127
5) SLOPE FARMING MODEL PROJECT	637	319	956
6) GROUNDWATER DEVELOPMENT MODEL PROJECT (IRRIGATION USE)	954	318	1,272
3. AGRICULTURAL SUPPORT GROUP & FARMERS' ORGANIZATION MODEL PROJECT	1,670	2,058	3,728
1) AGRICULTURAL IMPROVEMENT EXTENSION OFFICES IMPROVEMENT MODEL PROJECT	1,362	1,060	2,422
2) PROJECT EXTENSION AND PROMOTION MODEL PROJECT	308	998	1,306

TABLE 8.3.1 IMPLEMENTATION PLAN

Project Description	Unit	Qty	Project Cost	Phase 1		Phase 2		Phase 3		2009	2010			
				1997	1998	2000	2001	2002	2003			2004	2005	2006
1. BASIN CONSERVATION PLAN			325,022											
(1) FLOOD CONTROL PLAN	km	15.5	314,492											
(1) RIVER IMPROVEMENT PLAN	set	1	1,324											
(2) FLOOD CONTROL FACILITIES PLAN														
(2) AFFORESTATION PLAN	pieces	1	4,134											
(3) AFFORESTATION TECHNOLOGY DEVELOPMENT PLAN	"	1	175											
(4) AFFORESTATION TECHNOLOGY EXTENSION PLAN														
(3) SOIL CONSERVATION PLAN	"	1	310											
(5) SOIL CONSERVATION TECHNOLOGY DEVELOPMENT PLAN	"	1	246											
(6) SOIL CONSERVATION TECHNOLOGY EXTENSION PLAN	"	10	360											
(7) SABO DAM PLAN														
(4) INTEGRATED WATER MANAGEMENT PLAN			3,981											
(8) METEOROLOGICAL-HYDROLOGICAL OBSERVATION SYSTEM IMPROVEMENT PLAN	set	1	149,044											
2. AGRICULTURAL DEVELOPMENT PLAN														
(1) LIVESTOCK DEVELOPMENT PLAN	pieces	1	72											
(1) SWINE PRODUCTION PLAN	pieces	1	81											
(2) POULTRY FARMING PLAN	pieces	1	154											
(3) LIVESTOCK HEALTH SERVICES IMPROVEMENT PLAN														
(2) INLAND FISHERIES EXTENSION PLAN	pieces	1	127											
(4) INLAND FISHERIES PLAN														
(3) AGRICULTURAL INFRASTRUCTURE IMPROVEMENT PLAN														
(5) SLOPE FARMING PLAN	pieces	1	956											
(6) GROUNDWATER IRRIGATION PLAN	ha	2,100	21,975											
(7) FARMLAND DRAINAGE PLAN	ha	1,790	1,992											
(8) FARM ROADS IMPROVEMENT PLAN	km	52.75	1,043											
(4) RURAL INFRASTRUCTURE IMPROVEMENT PLAN														
(9) MULTIPURPOSE BUILDING CONSTRUCTION PLAN	pieces	40	410											
(10) RURAL WATER SUPPLY FACILITIES CONSTRUCTION PLAN	no. of wells	14,570	4,204											
(11) RURAL TOILETS CONSTRUCTION PLAN	"	14,242	636											
(12) RURAL ROADS IMPROVEMENT PLAN	km	274	112,906											
3. AGRICULTURAL SUPPORT GROUP-FARMERS' ORGANIZATION FORMULATION PLAN			10,534											
(1) AGRICULTURAL SUPPORT GROUP IMPROVEMENT PLAN	pieces	9	7,049											
(1) AGRICULTURAL EXTENSION OFFICES REINFORCEMENT PLAN	"	1	1,304											
(2) PROJECT PROMOTION AND EXTENSION PLAN														
(2) DISTRIBUTION SYSTEM IMPROVEMENT PLAN	"	4	1,229											
(3) AGRICULTURAL DISTRIBUTION SYSTEM IMPROVEMENT PLAN														
SYSTEM IMPROVEMENT														
TOTAL PROJECT COST			485,500	5,612	9,391	79,110	75,306	83,552	64,877	64,869	10,043	9,409	9,409	9,409

* MODEL PROJECT

CHAPTER 9
PROJECT EVALUATION



CHAPTER 9 PROJECT EVALUATION

9.1 Outline

The major objective of the evaluation is to verify economic and environmental viability by assessing the overall impact of the project on the national economy. Cost-benefit analysis shall be conducted using the economic internal rate of return (EIRR). The EIRR and benefit for recipients is calculated below and the environmental impact assessment is shown in the subsequent section.

This section evaluates the master plan and model projects for which costs estimates have already been considered. The estimation of the benefits shall be in accordance with the conditions used in the cost estimation for the required project facilities and equipment.

9.1.1 Master Plan

Master plans have several benefits, and they are either tangible or intangible. Some benefits support the benefits generated by other projects or help prevent the loss of existing economic benefits. The master plans are as follows:

- Flood control plan (river improvement, flood control facilities construction, sabo dam)
- Afforestation plan (afforestation technology development and extension)
- Swine production plan
- Poultry farming plan
- Inland fishery plan
- Slope farming improvement plan
- Groundwater development plan (irrigation, drainage improvement, rural roads improvement)
- Agricultural distribution improvement plan
- Soil conservation plan (soil conservation technology development and extension)
- Meteorological and hydrological observation system improvement plan
- Multipurpose building/hall construction plan
- Rural water supply plan
- Rural sanitation plan (lavatory construction)
- Animal health services improvement plan
- Rural roads improvement plan
- Reinforcement of agricultural technical extension plan (extension office reinforcement, project promotion and extension)

The benefits generated by each plan, and the costs required are shown in the annex in detail.

9.1.2 Model Project

Some model projects are similar in context to the master plan, namely the ① afforestation model project, ② swine production model project, ③ poultry farming model project, ④ inland fisheries model project, ⑤ animal health services improvement model project, ⑥ slope farming model project, and ⑦ agricultural distribution improvement model project. Other model projects, the details of which are elucidated in other chapters herein, are scaled down versions of the master plans. They are as follows:

- Soil conservation technology development model project (soil conservation technology development and extension)
- Meteorological and hydrological observation system improvement model project
- Groundwater development model project (irrigation use).
- Reinforcement of agricultural techniques extension model project (reinforcement of extension office, project promotion and extension)

9.2 Economic Evaluation

9.2.1 EIRR

Table 9.2.1 shows the EIRR of the master plans in a 20 year period. The EIRR shows how beneficial the project can be and projects with relatively high EIRR are usually considered exceptional.

Projects with an EIRR of over 10% are generally considered appropriate in view of its economic impact. Those with an EIRR of under 10 % are inferior plans. Although fuelwood and timber production are the only afforestation benefits underscored, the afforestation plan shall have a significant impact on the environment.

Table 9.2.2 shows the EIRR of model projects in a 20 year period.

9.2.2 Income per Recipient

Another way of evaluating the economic impacts of a project is by the comparison of total income per recipient at present value. Some plans and model projects are excluded in this analysis because they are not economically stable and their EIRR is under 0 %; projects or plans with an EIRR of under 6% were also excluded from the calculation. The calculation of present value adopts an EIRR of 6 % as discount rate.

Table 9.2.3 shows the income per recipient of master plans in a 20 year period at the present value of 6 %. The groundwater development plan was calculated to generate the highest income per recipient, followed by the slope farming plan, the inland fisheries plan, and the swine production plan, respectively. These plans were calculated to generate a total income of over US\$ 800. Table 9.2.4 shows the total income per recipient of model projects in a 20 year period at present value of 6 %. The model projects calculated to generate high income were ranked and the order of ranking was similar to the master plans ranked from 1 to 5.

Table 9.2.1 EIRR of Master Plans in a 20 Year Period

	Master Plan	EIRR (%)
1	Groundwater Development (Irrigation Use)	11.4
2	Rural Roads Improvement	11.0
3	Agricultural Products Distribution System Improvement *	10.7
4	Inland Fisheries *	10.6
5	Slope Farming *	10.5
6	Swine Production	10.0
7	Soil Conservation	9.8
8	Reinforcement of Agricultural Techniques Extension Office	9.7
9	Rural Water Supply	9.4
10	Poultry Farming *	8.8
11	Afforestation *	7.4
12	Animal Health Services Improvement *	6.3
13	Rural Sanitation (lavatory construction)	6.2
14	Multipurpose Building/Hall Construction	3.4
15	Meteorological & Hydrological Observation System Improvement	1.8
16	Sabo Dam	0.5

* same as the model projects

Table 9.2.2 EIRR of Model Projects in a 20 Year Period

	Model Projects	EIRR (%)
1	Groundwater Development (Irrigation Use)	12.9
2	Soil Conservation	11.1
3	Agricultural Products Distribution System Improvement *	10.7
4	Inland Fisheries *	10.6
5	Slope Farming *	10.5
6	Swine Production *	10.0
7	Reinforcement of Agricultural Techniques Extension Office	9.6
8	Poultry Farming *	8.8
9	Afforestation	7.4
10	Animal Health Services Improvement *	6.3
11	Meteorological & Hydrological Observation System Improvement	0.4

* same as master plans

Table 9.2.3 Income per Recipient of Master Plans in a 20 Year Period

Master Plan	Present Value (US\$1000)	Total Number of Recipients	Net Income Per Recipient (US\$1000)	Recipients Components
1 Groundwater Development (Irrigation Use)	38,292	5,037	7,602	no. of recipients calculated by multiplying 1996 population density by area of candidate site for irrigation
2 Slope Farming	360	64	5,625	members of the agricultural cooperative "30 de Octubre"
3 Inland Fisheries	68	65	1,046	members of the 2 Adesco units in Verapaz
4 Swine Production	27	32	844	members of the San Francisco agricultural cooperative
5 Animal Health Services Improvement	285	1,965	145	Block D agricultural population
6 Rural Roads Improvement	32,157	322,644	100	total population in Jiboa River basin in 1996
7 Soil Conservation	29,356	322,644	91	total population in Jiboa River basin in 1996
8 Reinforcement of Agricultural Extension Office	2,247	25,562	88	Jiboa River basin agricultural population
9 Poultry Farming	5	64	78	members of the agricultural cooperative "30 de Octubre"
10 Rural Water Supply	5,175	93,300	55	total household population to be serviced (no. of households x 5 persons)
11 Agricultural Products Distribution System Improvement	694	25,562	27	Jiboa River basin agricultural population
12 Afforestation	87	205,644	0	population of Block A1

Table 9.2.4 Income per Recipient of Model Projects in a 20 Year Period

Model Projects	Present Value (US\$1000)	Total Number of Recipients	Net Income Per Recipient (US\$1000)	Recipients Components
1 Groundwater Development (Irrigation Use)	2,293	49	46,796	farmers in the candidate site for irrigation
2 Slope Farming	360	64	5,625	members of the agricultural cooperative "30 de Octubre"
3 Inland Fisheries	68	65	1,046	members of the 2 Adesco units in Verapaz
4 Swine Production	27	32	844	members of the San Francisco agricultural cooperative
5 Animal Health Services Improvement	285	1,965	145	Block D agricultural population
6 Reinforcement of Agricultural Extension Office	1,108	8,520	130	1/3 of the Jiboa River basin agricultural population
7 Poultry Farming	5	64	78	members of the agricultural cooperative "30 de Octubre"
8 Soil Conservation	8,240	205,644	40	population of Block A1
9 Agricultural Products Distribution System Improvement	694	25,562	27	Jiboa River basin agricultural population
10 Afforestation	87	205,644	0	population of Block A1

9.2.3 Economic Recommendations

Based on the results of the economic evaluation, the master plans and model projects considered as excellent should be implemented. Social instability still prevails in El Salvador, especially in rural areas, as an aftermath of the 12 year civil war. Since the rural areas are mainly into farming, the development of agriculture is perceived to promote social development and stability. Accordingly, the conduct of ordinary master plans and model projects should also be given importance.

9.3 Initial Environmental Assessment (IEE)

The results of the initial environmental examination are shown in Table 9.3.1 and 9.3.2, and summarised as follows. Moreover, the details are shown in the Annex, from H-4- 1 to H-4-3.

(1) Social environment

This project aims to improve the standard of living of the small scale farmers and cooperative farmers in the Jiboa River basin with due consideration of basin conservation.

1) Way of Life

The Project does not include the construction of a large dam, land acquisition and irrigation works. Thus, it is not foreseen to incur significant problems such as resident opposition, resettlement, or changes in lifestyle. The implementation of the Project shall be cautiously done to avoid incongruities in the earnings of beneficiaries. The conduct of model projects requires prudent negotiations with land owners regarding the acquisition of essential lands for the construction of a fish pond in Verapaz, animal health services improvement office downstream, etc.

2) Demography

Since this Project does not entail farmland development, drastic increase in population and changes in population structure by migration are not expected. However, with the improvement of farm roads, the traffic volume is predicted to increase.

3) Institution and customs

Many landless farmers in the basin work as tenant farmers. The formation of a farmers' organization and the improvement of women's social status, the latter through training in agro-processing and needlework, is expected to impel significant changes in the rural social structure.

4) Health and Sanitation

a) Agro-chemicals

Through the adequate administration of fertiliser utilization, this project aims to control pesticide use, minimize agro-chemical use, and restrict the use of highly residual agro-chemicals. This project is therefore not predicted to contaminate the environment.

b) Epidemic and endemic diseases

The prevailing diseases in the Study Area are mostly respiratory and water-borne diseases. Irrigation and inland fisheries could generate dengue fever or malaria, thus countermeasures against the breeding of mosquitoes should be taken.

c) Increase in solid waste and excreta

The implementation of the project shall not have a direct impact on solid waste volume. However, urbanization in the metropolis upstream, is forecast to increase the population and consequently the volume of solid waste dumped outdoors. Also, industrial effluent and ashes from the combustion of waste is perceived to adversely affect the basin ecosystem.

5) Protected Natural Areas and Historical and Cultural Assets

The area protected for the preservation of wild deers extends over the middle and downstream basin areas where San Pedro Masahuat and San Antonio Masahuat are located, and is managed with the support of FIAES. As previously stated in section 3.2.4, Social Environment items (7) & (8), historical ruins exist in the basin. Hence, if the areas covering these sites are to be included in the project, sufficient consideration should be taken.

(2) Natural Environment

1) Bio-ecosystem

Fauna species covered by the CITES inhabit the Jiboa River basin. A study should be carried out to determine whether increased traffic volume via the improvement of the rural roads shall adversely affect these species.

A mangrove forest covers a small part of the Jiboa River mouth vicinity. Particular care should be taken therefore when constructing the revetment works for flood control.

2) Soil and Land Conditions

Erosion in the upstream and midstream basin areas is particularly severe in blocks D and E. Surface soil runoff is also considered to have reduced the fertility of the soil in these areas, hence the importance of constructing physical and farming conservation measures (sabo dam, live barriers, contour cropping, agroforestry, afforestation). There is also a need to understand the actual soil characteristics in view of USAID's report stating the

extraction of residual agrochemicals in well water. As for sedimentation at the river mouth area, the transported sediments should be analysed.

3) Hydrology

The project shall conduct groundwater development for irrigation of fields downstream, along with the installation of drainage facilities in areas with poor drainage conditions. These works are forecast to slightly incur changes in flow regime. As over-tapping of groundwater may result in sea water infiltration into the aquifers in the lower basin, pumping tests should be done to analyse groundwater quality/table and rate of recharge.

4) Water Quality and Temperature

With the development of groundwater for irrigation downstream, improvement in cropping ratio and increase in fertilizer and agro-chemical usage are expected. As a slight loss during distribution may occur, it is very important to consider an appropriate water management plan, and to plan the regulation of fertilizer and material input.

5) Natural Environment and Mining Resources

This project intends to conduct revetment works as a flood control measure. The construction, however, should be in harmony with the surrounding landscape in consideration of tourism and ethnological concerns.

Table 9.3.1 Environmentally Sensitive Areas in the Project Site or Vicinity

Environmentally Sensitive Areas	Applicable or Not					
	In Project Area			Vicinity of Project Area		
	(1) Appl	(2) N.A.	(3) Unkn	(1) Appl	(2) N.A.	(3) Unkn
<i>1) Specified areas</i>						
1. Habitat of fauna and flora listed in CITES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Wetland designated under the Ramsar Convention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sites listed in the World Heritage Convention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. National parks, natural reserves, etc.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>2) Socio-economically sensitive areas</i>						
5. Areas inhabited by indigenous peoples, ethnic minorities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Historical remains, cultural assets, scenery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Areas likely to suffer from significant negative economic impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>3) Environmentally sensitive natural lands</i>						
8. Arid and semi-arid lands (including savannah, rangeland, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Tropical rain forest and wild lands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Wetlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Peat lands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Mangrove forests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Coral reefs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. Mountainous, steep-sloped, or devastated lands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Closed water bodies such as lakes, swamps or reservoirs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes: (1)Appl : Applicable; (2)N.A. : Not Applicable; (3)Unkn : Not readily known

Table 9.3.2

IEE Results

Environmental Items		Evaluation	Future Courses of Action
3	Substantial changes in way of life	C	Survey related to diffusion of WID activities
4	Conflict among communities and peoples	C	Analysis of interdependence among the beneficiaries during conduct of the project activities
6	Population increase	C	Analysis of relation of population increase and intensification of training ability as a result of increase in production and road improvement.
12	Changes in existing social systems and customs	C	Analysis of farmer's organization and WID activities
14	Increased use of agrochemicals	C	Qualitative survey on increased chemical use due to improved cropping intensity, which resulted from the extension of the cropping pattern nation-wide
16	Spreading of epidemic disease	C	Analysis of relation between irrigation facilities, fishing pond and the prevalence of malaria and dengue fever
18	Increase in domestic waste	B	Study on population increase as a result of the urbanization of upper basin areas near the metropolis
21	Negative impacts on important or indigenous fauna and flora	C	Analysis of the relation between the natural ecosystem and increase in traffic volume due to improvement of farm roads
26	Destruction of mangrove forests	C	Analysis of relation to flood control works downstream
28	Soil erosion	B	Formulation of physical and agronomical soil conservation measures and suitable land use plan
30	Deterioration of soil productivity	C	Same as No 28
31	Soil contamination by agrochemicals, etc.	C	Soil analysis based on the detection of agricultural chemical residue in river water and wells downstream
32	Devastation of hinterland	B	Analyse the possibility of cultivating annual crops on the slopes upstream
35	Changes in surface water hydrology	C	Study the relationship between groundwater irrigation and drainage downstream
36	Changes in groundwater hydrology	B	Same as item No.35
38	Sedimentation	B	Study sedimentation conditions at the Jiboa river mouth
41	Water quality contamination and deterioration	C	Study relationship with the increase in fertilizer /agro-chemical use due to increase in cropping intensity
42	Eutrophication	C	Study correlation with the increase in fertilizer use and animal excreta due to dissemination of recommended cropping pattern
46	Damage on landscape	C	Study effects of flood control revetment works to landscape

(Rating)

A: Expected to incur serious impacts

B: Expected to incur slight impact

C: Unclear (requiring studies, but may be clarified in the course of the project)

(3) Environmental Education Plan

1) Necessity of Environmental Education

One of the factors that has made water quality contamination a big social problem is the little concern bestowed by businessmen and consumers on environmental conservation. To improve the polluted condition of the Jiboa River in the future, regulations, and monitoring and improvement measures must be imposed on each generation source. Environmental education programs should also be conducted to increase the awareness of people involved.

The environmental education programs in El Salvador are currently conducted by university faculties involved in relevant environmental studies. In the future, these programs should be comprehensively and continuously conducted in cooperation with the non-governmental organization, Fundacion Amigos del Lago de Ilopango, which does not only focus on water quality conservation measures but also on the improvement of furnaces for the effective use of firewood.

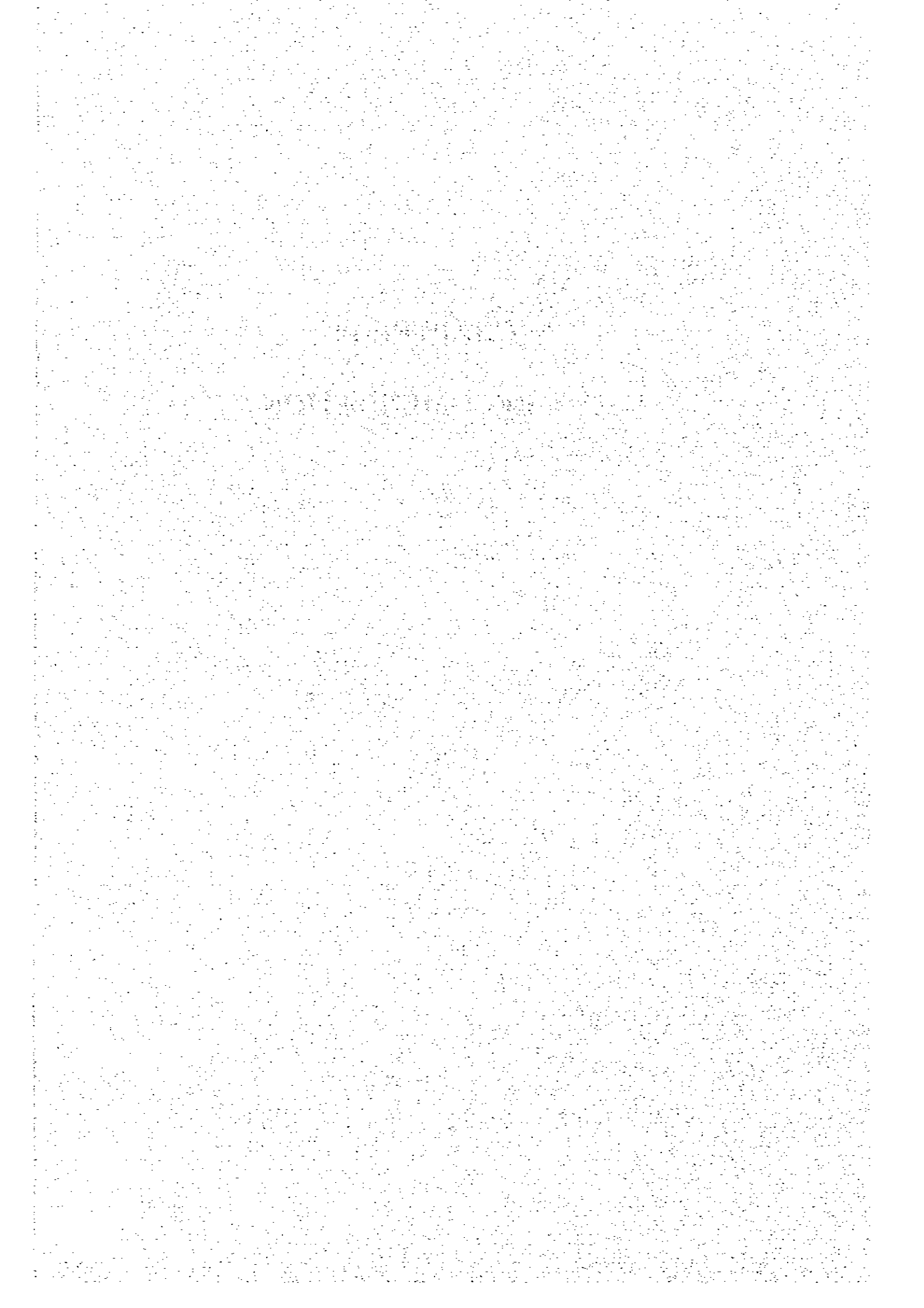
2) Issues requiring short or medium-term review

Activities promoting afforestation should be organized and introduced into the curriculum of primary and middle schools in cooperation with the nursery centre to be established through this project.

3) Issues requiring medium or long term review

For the reinforcement of the 3 extension offices previously mentioned in preceding chapters herein, environmental education programs should be planned for the inhabitants. These programs should entail lectures by SEMA or concerned NGOs, the organization of a workshop, and audio-visual presentations, such as short films on environmental conservation, to increase the awareness of the public with regard to the importance of environmental conservation

CHAPTER 10
RECOMENDATION



CHAPTER 10 RECOMMENDATIONS

This project will activate the national economy, promote environmental conservation, and help solve relevant problems nationwide, as it aims to ① increase the income and stabilize the living conditions of small scale farmers, ② activate the metropolitan economy, ③ conduct tree planting in the metropolitan area, ④ improve women's social status, and ⑤ effectively use excellent farmlands in the downstream basin. The urgent implementation of the model projects herein is strongly recommended, particularly because of their significance in solving the aforesaid problems, and the verification and demonstration of the results of countermeasures proposed.

The early completion of the project is greatly desired for the dissemination of the effects nationwide. In respect to this, the following recommendations are made to the Government of El Salvador.

- (1) To consider a financing plan that also encompasses assistance from foreign organizations to finish the project according to the scheduled implementation plan.

The model projects shall promote the development project by establishing the system required and the verification and demonstration of the benefits that can be anticipated from the implementation of the latter.

Two of the aforesaid model projects may exceed their budget. Therefore, the success of the project largely depends on the possibility of acquiring the capital required. The proposed irrigation plan shall effectively contribute to agricultural structure improvement. Although the river improvement plan monopolizes more than half of the project cost, it shall eliminate flooding downstream -- the most critical concern of this project -- and lead to the effective use of farmlands downstream with high agricultural development potential.

- (2) To establish an organization within the DGRNR to plan, supervise and direct the implementation and operation and maintenance of the project.

This organization shall be capable of procuring the necessary funds for the project, conduct surveys vital to its implementation, and able to cooperate with related organizations, municipalities and the residents.

- (3) To train the staff, especially through overseas technical cooperation, if available, to ensure the smooth implementation of the project and competent operation and maintenance.

This project shall be introducing quite a number of new techniques. It is, therefore, important to secure the right number of staff and improve their skills, to ensure the proper diffusion of these techniques and help farmers realize their importance. The training

program may either be through the use of foreign experts or the dispatch of the head of the staff for training overseas. The fields that would require training are afforestation (including agroforestry), farm management (vegetables, fruit trees, cereals), soil fertilization, livestock raising (cattle, pigs, chicken), inland fisheries, soil conservation, extension activities, irrigation, agricultural distribution (including agricultural statistics), the forming of a farmers' organization.

- (4) To establish regulations and legislation on tenancy, financing, farmers' organization, and taxation -- factors relevant to the smooth conduct of the project.

To activate agricultural activities, it is very important to establish relevant systems and legislation, as well as the formation of an organization, or the reinforcement of an existing one, to take charge of their execution.

- (5) To cooperate closely with organizations related to education, welfare, public services, water supply, sewerage, etc., to ensure the improvement of the agricultural distribution system and the standard of living of the farmers.

This project deals with a lot of areas under the jurisdiction of several government institutions. These areas, particularly matters concerning roads and traffic, shall influence the implementation of this project. Therefore, to ensure the smooth implementation of this project, the implementing agency should establish a close relationship with relevant institutions or organizations.

- (6) To encourage participation, it is necessary to fully explain the details and importance of the project to the farmers.

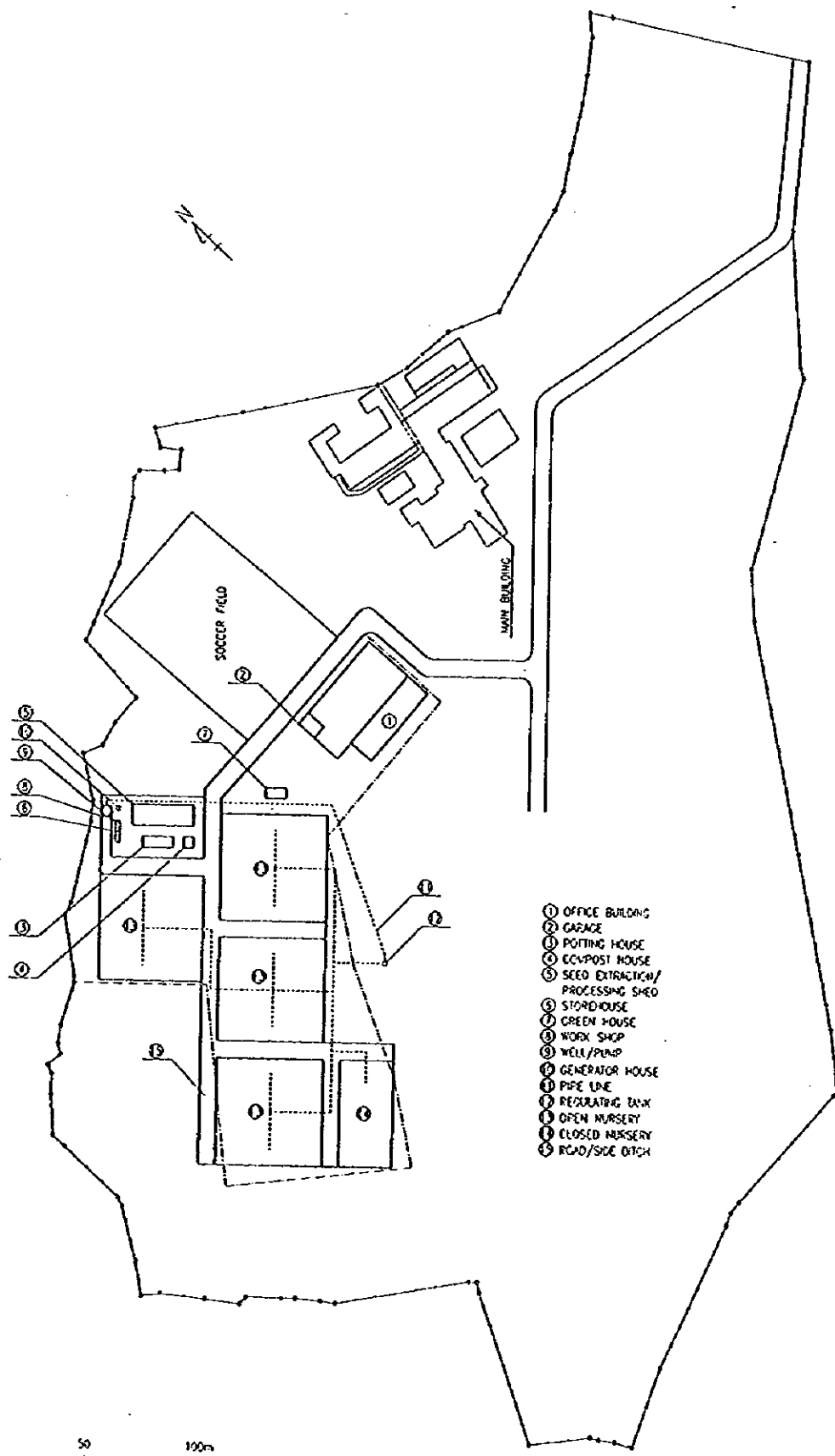
With the exclusion of the procurement of funds stated in item (1), there are quite a number of works that can be relegated to the farmers or the municipalities. The farmers' full comprehension of the project's importance is therefore vital. As mentioned in the master plan, one way to stimulate participation is by laying out lucrative incentives. Nonetheless, without full comprehension of the importance of the project and its accompanying benefits, this would be ineffective. Hence the need to thoroughly explain the details of the project to the farmers.

ANNEX 1

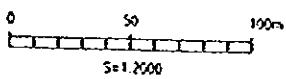
LIST OF THE MODEL PROJECT FACILITIES

LIST OF THE MODEL PROJECT FACILITIES

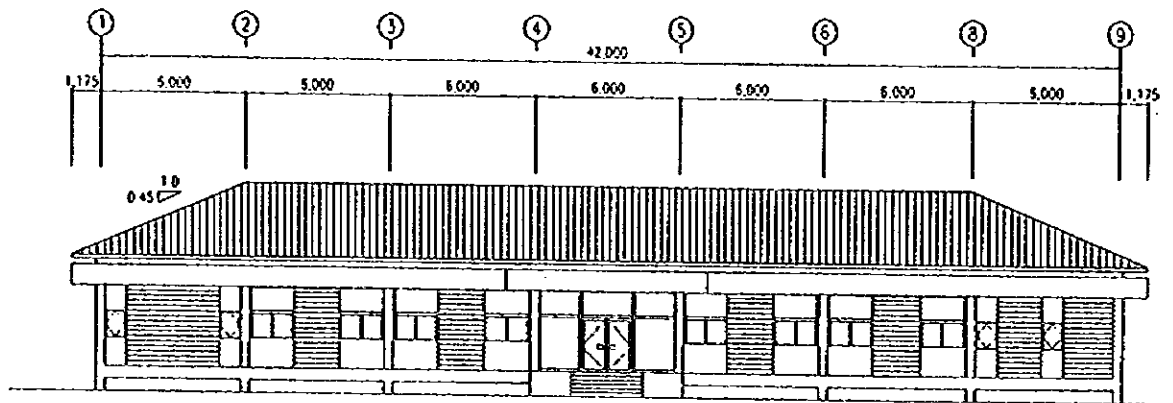
1. PLAN OF AFFORESTATION PROMOTION CENTER
2. OFFICE BUILDING OF AFFORESTATION PROMOTION CENTER
3. NURSERY
4. HOG PEN
5. CHICKEN HOUSE (TYPE 1)
6. CHICKEN HOUSE (TYPE 2)
7. ANIMAL HEALTH SERVICE IMPROVEMENT OFFICE
8. AGRICULTURAL EXTENSION OFFICE BUILDING
9. HANGER / CAR PORT
10. AGRICULTURAL MARKETING OFFICE / STORAGE
11. WELL AND UNDERWATER PUMP



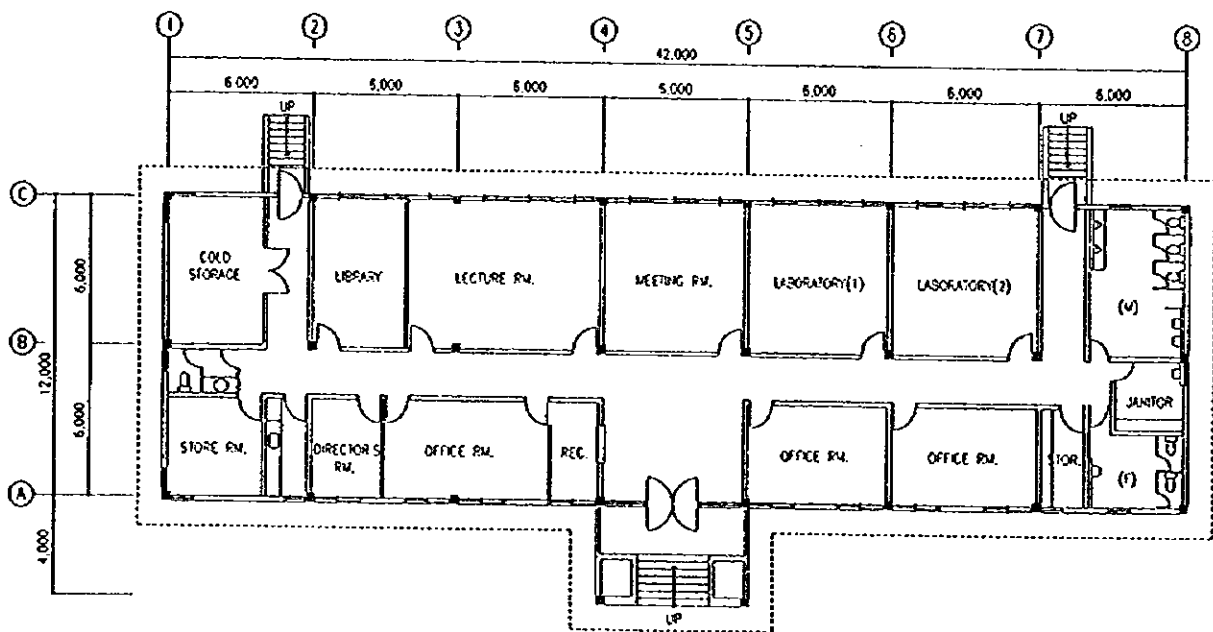
- ① OFFICE BUILDING
- ② GARAGE
- ③ POTTING HOUSE
- ④ ECO-POST HOUSE
- ⑤ SEED EXTRACTION/PROCESSING SHED
- ⑥ STOREHOUSE
- ⑦ GREEN HOUSE
- ⑧ WORK SHOP
- ⑨ WELL/PUMP
- ⑩ GENERATOR HOUSE
- ⑪ PIPE LINE
- ⑫ REOXYGENATING TANK
- ⑬ OPEN NURSERY
- ⑭ CLOSED NURSERY
- ⑮ ROAD/SIDE DITCH



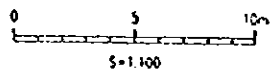
PLAN OF AFFORESTATION PROMOTION CENTER



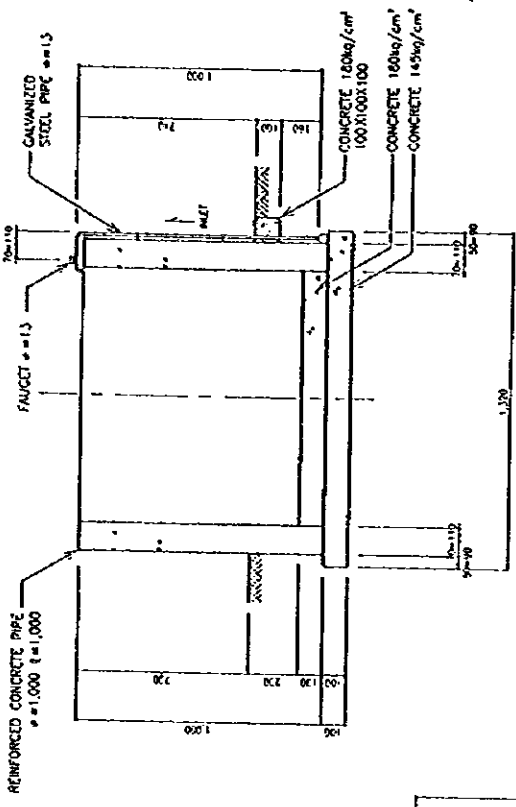
FRONT ELEVATION



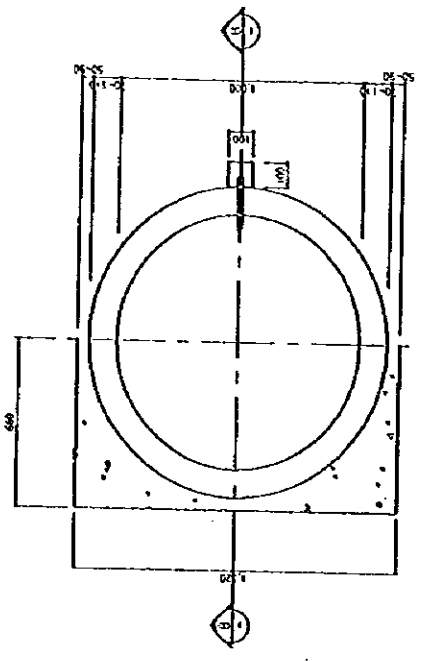
OFFICE BLD. FLOOR PLAN



OFFICE BUILDING OF
AFFORESTATION PROMOTION CENTER



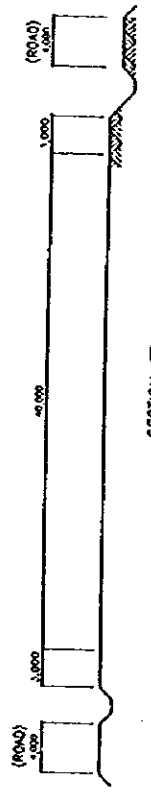
SECTION B



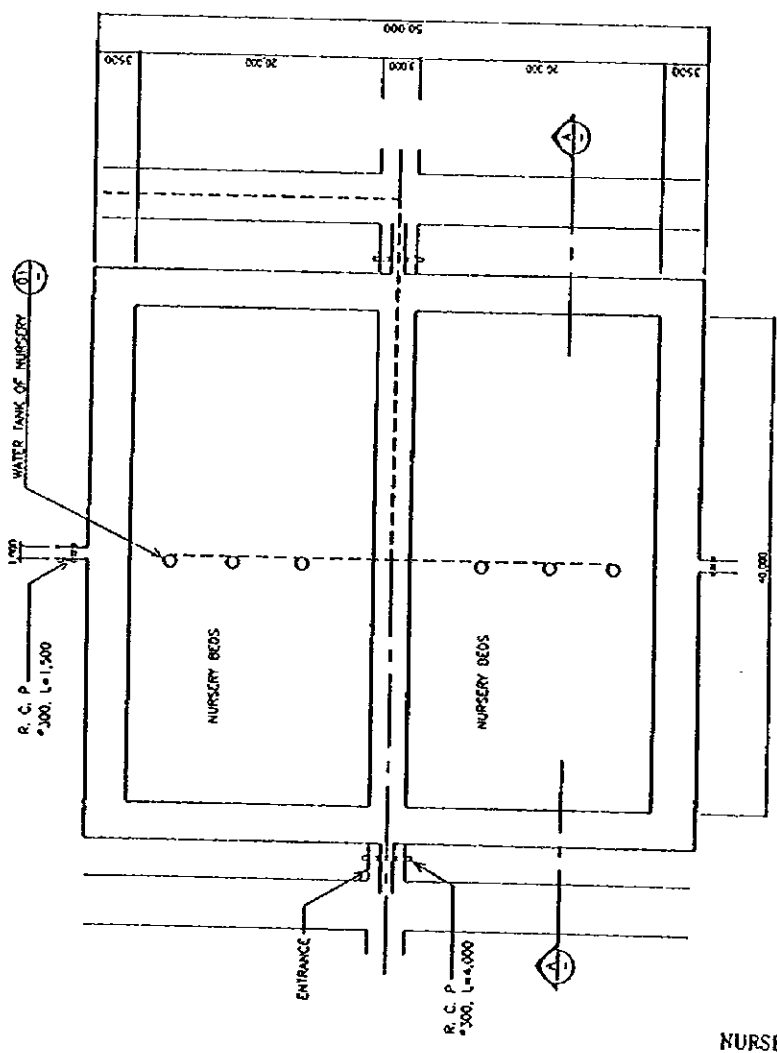
PLAN S=1:20

DETAIL D

WATER TANK OF NURSERY S=1:20

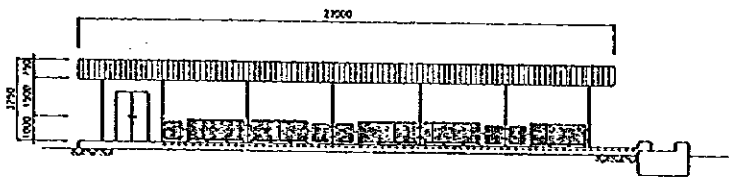


SECTION A

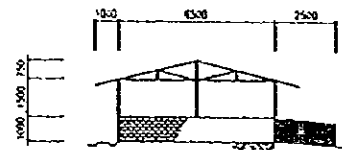


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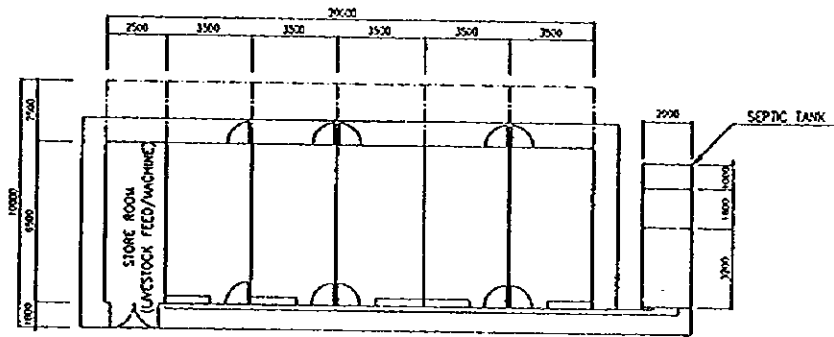
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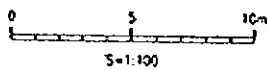
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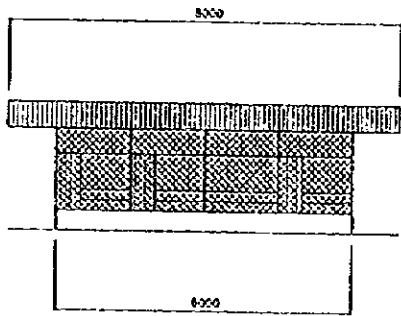
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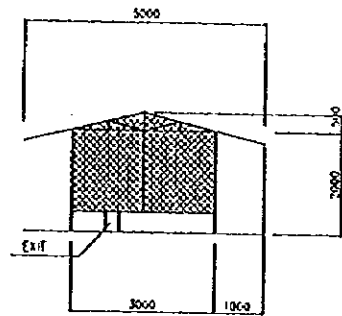
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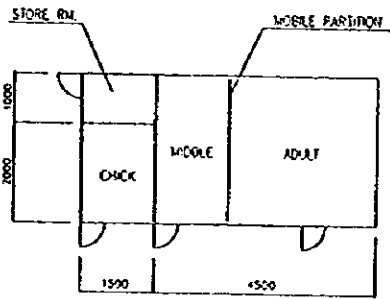
HOG PEN



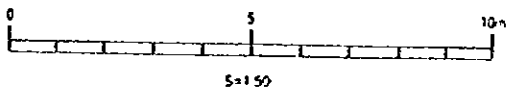
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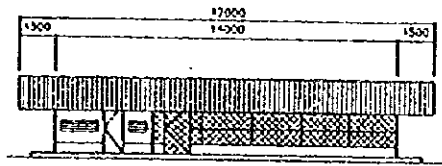
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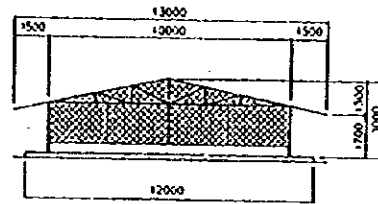
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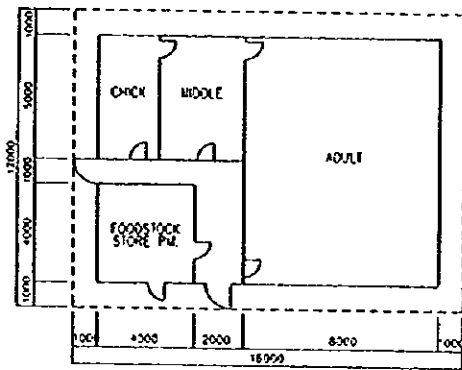
CHICKEN HOUSE (TYPE-1)



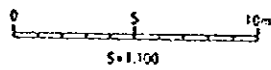
FRONT ELEVATION



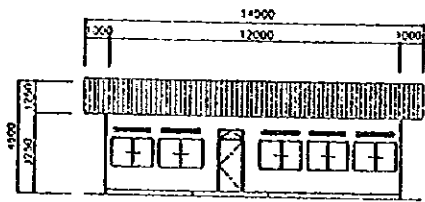
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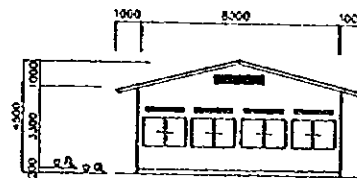
PLAN



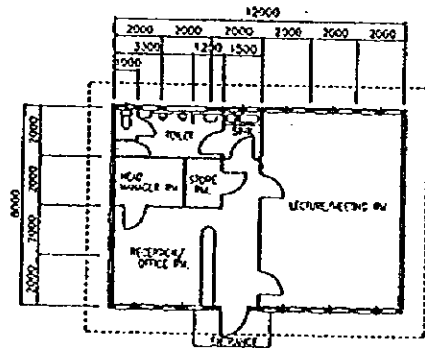
CHICKEN HOUSE (TYPE-2)



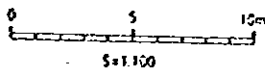
FRONT VIEW



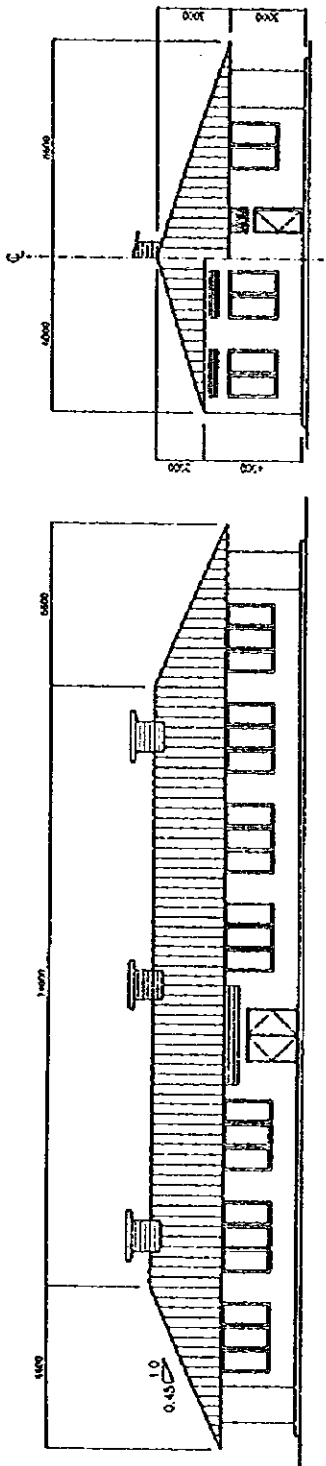
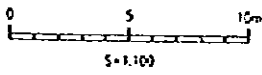
PROFILE



PLAN

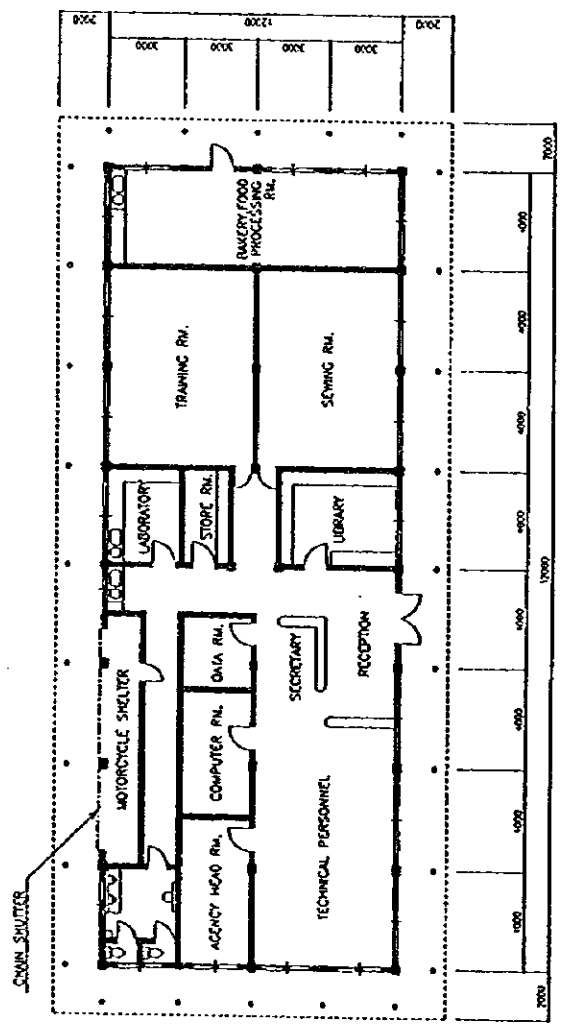


ANIMAL HEALTH SERVICE IMPROVEMENT OFFICE



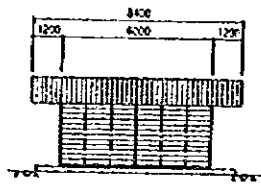
PROFILE

FRONT VIEW

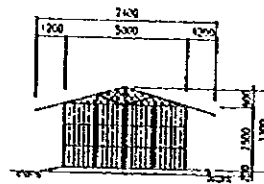


FLOOR PLAN

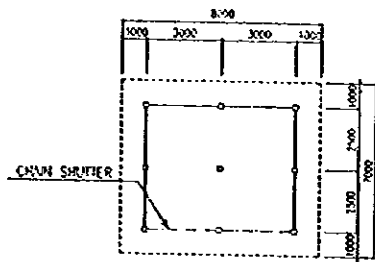
AGRICULTURAL EXTENSION
OFFICE BUILDING



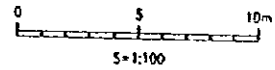
FRONT VIEW



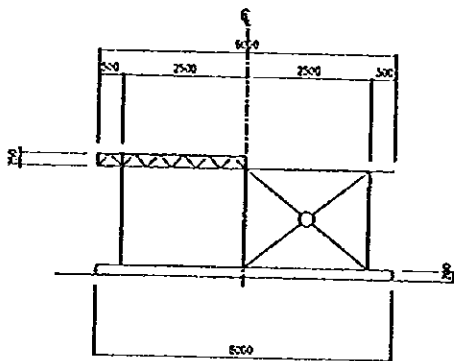
PROFILE



FLOOR PLAN

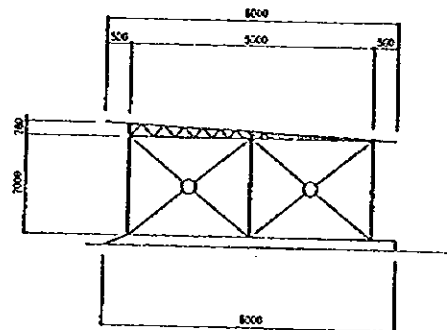


HANGAR



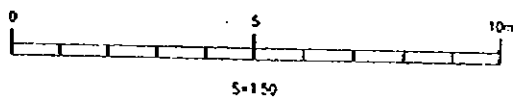
FRONT REAR

FRONT VIEW S=1:50

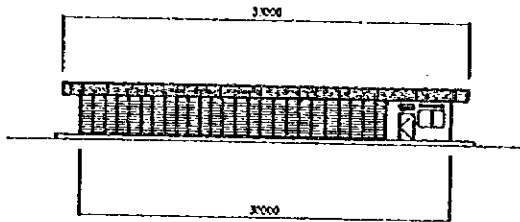


PROFILE S=1:50

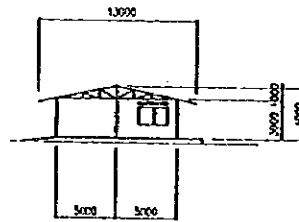
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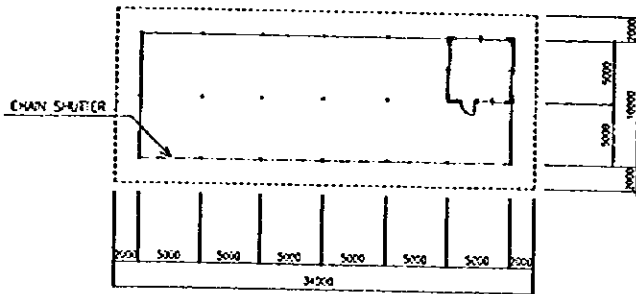
HANGAR/CAR PORT



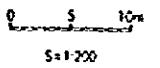
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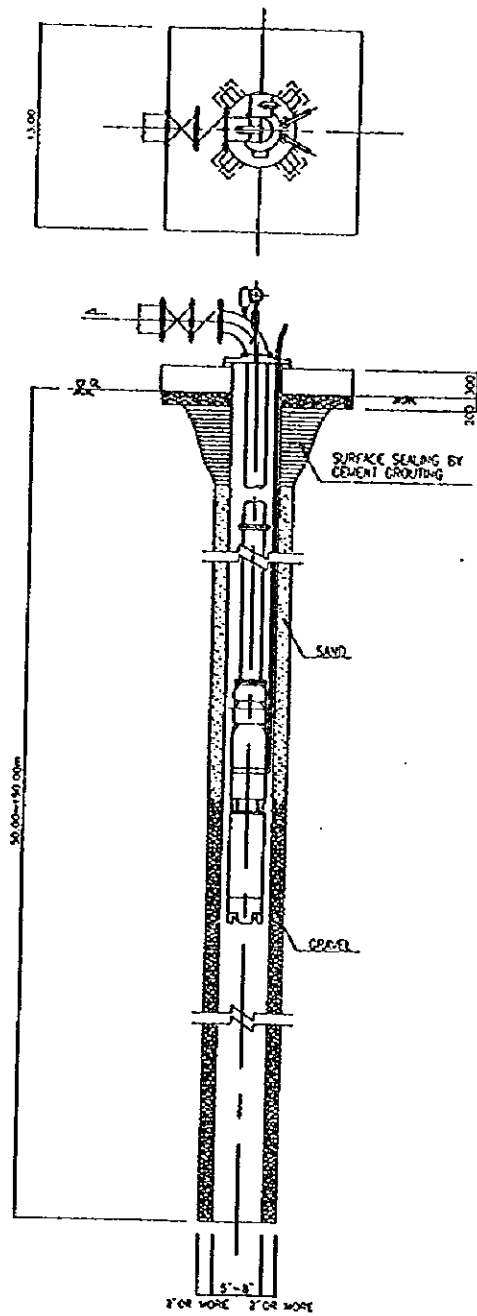
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FLOOR PLAN S=1:200



AGRICULTURAL MARKETING
OFFICE/STORAGE



11. WELL AND SUBMERSIBLE PUMP.

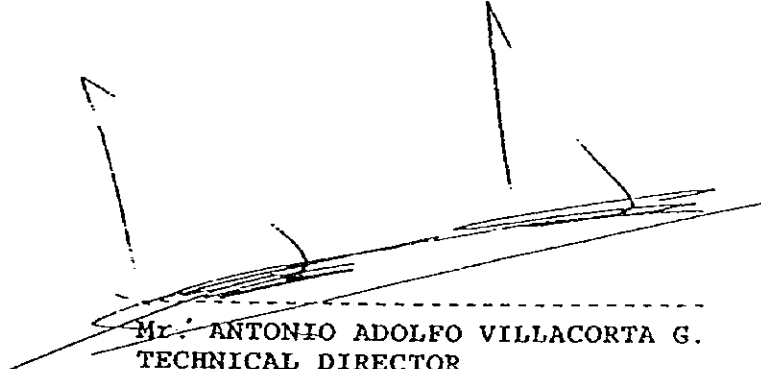
ANNEX 2

MINUTES OF MEETING

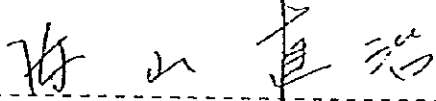
(S/W)

SCOPE OF WORK
FOR
THE MASTER PLAN STUDY
ON
THE JIBOA RIVER BASIN
INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT
IN
THE REPUBLIC OF EL SALVADOR
AGREED UPON
BETWEEN
MINISTRY OF AGRICULTURE AND LIVESTOCK
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

5th. September, San Salvador



Mr. ANTONIO ADOLFO VILLACORTA G.
TECHNICAL DIRECTOR
PLANNING OFFICE OF AGRICULTURE
MINISTRY OF AGRICULTURE AND
LIVESTOCK
THE REPUBLIC OF EL SALVADOR



Mr. NAOJI UCHIYAMA
LEADER
PREPARATORY STUDY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

I. INTRODUCTION

In response to the request of the Government of the Republic of El Salvador (hereinafter referred to as "the Government of El Salvador"), the Government of Japan has decided to conduct the Master Plan Study on the Jiboa River Basin Integrated Agricultural Development Project (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan. Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of El Salvador. The present document sets forth the scope of work with regard to the Study.

II. Objectives of the Study

The objectives of the Study are:

1. to conduct the Master Plan Study on the Jiboa River Basin Integrated Agricultural Development Project in the Republic of El Salvador paying much attention to environmental conservation.
2. to carry out technology transfer to the counterpart personnel of the Government of El Salvador in the course of the Study.

III. Study Area

The Study area covers an area of about 60,000 ha. in Jiboa River Basin.

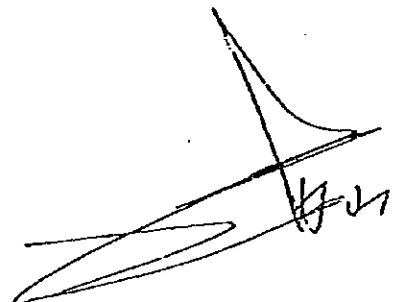
IV. Scope of the Study

In order to achieve the above objectives, the Study will consist of two (2) phases and following items.

1. Phase I.

1.1 Collection and Review of existing data and information, and field survey on the following items.

- (1) natural condition
- (2) social and economic condition
- (3) soil condition and land use
- (4) crop production
- (5) farmers' economy



- (6) agro - financing
- (7) irrigation and drainage
- (8) agricultural and rural infrastructures
- (9) agricultural supporting systems (farmers' organization, research, training and extension services, etc.)
- (10) agricultural processing and marketing systems
- (11) livestock and poultry
- (12) environmental destructive condition (forestry, soil erosion, flood)
- (13) others

1.2 Review of the existing development plans and projects in the Republic of El Salvador and the Study area.

1.3 Identification and analysis of the development potentials and constraints in the Study area based on the above surveys

2. Phase II

2.1 Collection of data and information through additional field surveys.

2.2 Formulation of the Master Plan with the inclusion of the following components.

- Agriculture development plan
- Farmers supporting plan (research, extension, financing etc.)
- Agricultural and rural infrastructure plan
- Environmental conservation plan (including soil conservation, flood prevention, social forestry etc.)

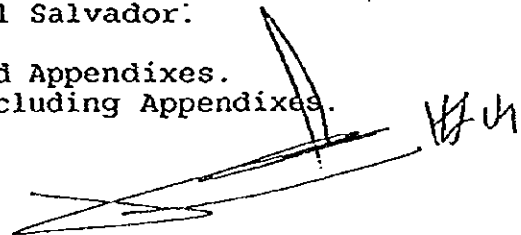
V. Study Schedule

The Study will be carried out in accordance with the tentative schedule attached in the Annex.

VI. Report

JICA shall prepare and submit the following reports in English and Spanish to the Government of El Salvador:

- English Version in Main Report and Appendixes.
- Spanish Version in Main Report excluding Appendixes.

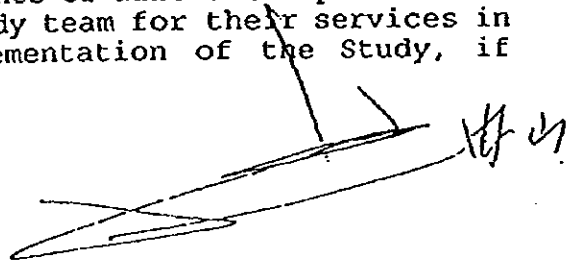


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- (1) Inception Report
Five (5) copies in English and ten (10) copies in Spanish at the commencement of the Study.
- (2) Progress Report (1)
Five (5) copies in English and ten (10) copies in Spanish at the end of first field work
- (3) Interim Report (1)
Five (5) copies in English and ten (10) copies in Spanish at the end of the first home office work in Japan.
- (4) Progress Report (2)
Five (5) copies in English and ten (10) copies in Spanish at the end of second field work.
- (5) Draft final Report
Five (5) copies in English and twenty (20) copies in Spanish at the end of the second home office work in Japan. The Government of El Salvador shall provide JICA with its comments within one (1) month after receipt of the Draft Final Report.
- (6) Final Report
Thirty (30) copies in English and fifty (50) copies in Spanish two (2) months after receiving comments on the Draft Final Report.

VII. Undertakings of the Government of El Salvador

1. The Government of El Salvador shall facilitate carrying out the study in accordance with the prevailing laws and regulations stipulated by El Salvador, as follows;
 - (1) to secure the safety of the Japanese study team;
 - (2) to permit the members of the Japanese study team to enter, leave and sojourn in El Salvador for the duration of their assignment therein, and exempt them from visa fees;
 - (3) to exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials to be brought into and out of El Salvador for the conduct of the Study;
 - (4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study, if necessary;

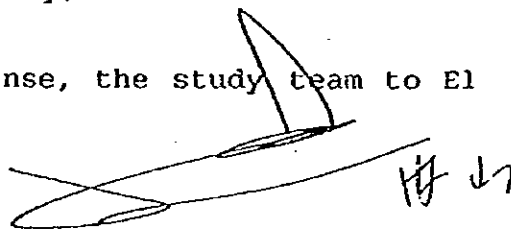


- (5) to provide necessary facilities to the Japanese study team for the remittance as well as the utilization of the funds introduced into El Salvador from Japan in connection with the implementation of the Study, if necessary;
 - (6) to obtain permission for entry into special area for the purpose of implementing the study;
 - (7) to secure permission which is considered and issued by the relevant authorities for the Japanese study team to take out all data and documents including maps and photographs related to the Study out of El Salvador to Japan;
 - (8) to provide medical services as needed. Its expenses will be chargeable on the members of the Japanese study team.
2. The Government of El Salvador shall bear claims, if any arises, against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.
 3. Ministry of Agriculture and Livestock (hereinafter referred to as "MAG") shall act as a counterpart agency to the Team and also as coordinating body in relation with other El Salvador organizations concerned for the smooth implementation of the Study.
 4. MAG shall act as the implementing agency. It shall undertake, at own expense, to provide the Japanese study team with the following, in cooperation with other organizations concerned:
 - (1) available data and information related to the Study;
 - (2) additional survey related to the Study, if necessary;
 - (3) counterpart personnel;
 - (4) suitable office space with necessary equipment and furniture, and
 - (5) credentials or identification cards.

VIII. Undertakings of JICA

For the implementation of the Study, JICA shall take the following measures:

- (1) to dispatch, at its own expense, the study team to El Salvador



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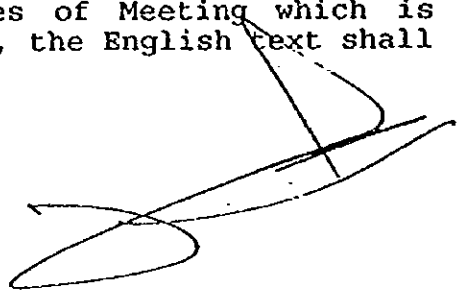
- (2) to pursue technology transfer to the counterpart personnel of the Government of El Salvador in the course of the Study.

IX. Consultation

JICA and the Government of El Salvador shall consult with each other in respect of any matter that may arise from or in connection with the Study.

X. Language

In case any divergency arises about interpretation of this Scope of Work and Minutes of Meeting which is prepared in English and Spanish, the English text shall prevail.



18/01

TENTATIVE SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Annex	
work in El Salvador																					
home office work in Japan																					
Phase	Phase 1										Phase 2										
Report	↑ IC/R	↑ P/R(1)	↑ IT/R	↑ P/R(2)	↑ DF/R	↑ F/R															

(Remarks)

- IC/R : Inception Report
- P/R(1) : Progress Report(1)
- IT/R : Interim Report
- P/R(2) : Progress Report(2)

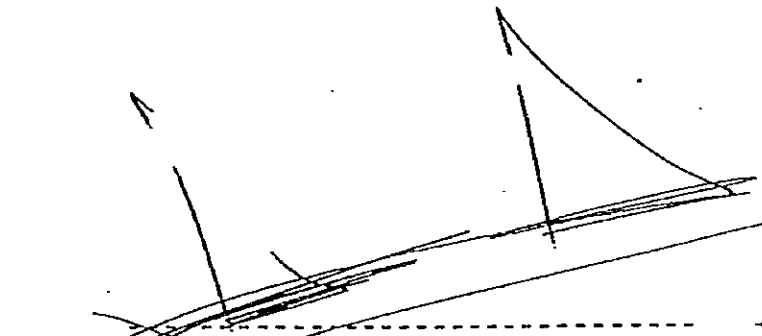
- DF/R : Draft Final Report
- F/R : Final Report

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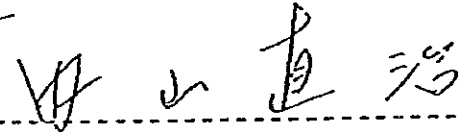
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MINUTES OF MEETING
FOR
THE MASTER PLAN STUDY
ON
THE JIBOA RIVER BASIN
INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT
IN
THE REPUBLIC OF EL SALVADOR
AGREED UPON
BETWEEN
MINISTRY OF AGRICULTURE AND LIVESTOCK
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

5th. September, San Salvador



MR. ANTONIO ADOLFO VILLACORTA G.
TECHNICAL DIRECTOR
PLANNING OFFICE OF AGRICULTURE
MINISTRY OF AGRICULTURE AND
LIVESTOCK
THE REPUBLIC OF EL SALVADOR



Mr. NAOJI UCHIYAMA
LEADER
PREPARATORY STUDY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

In response to the request of the Government of the Republic of El Salvador (hereinafter referred to as "the Government of El Salvador"), the Government of Japan has decided to dispatch the Preparatory Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan.

The Team, headed by MR. NAOJI UCHIYAMA, visited El Salvador from August to September, 1995, for the purpose of discussing and exchanging views on the Master Plan Study on the Jiboa River Basin Integrated Agricultural Development Project (hereinafter referred to as "the Study"), and had series of discussion with the officials concerned of the Ministry of Agriculture and Livestock (hereinafter referred to as "MAG"). The list of participants in the meeting is attached in Annex.

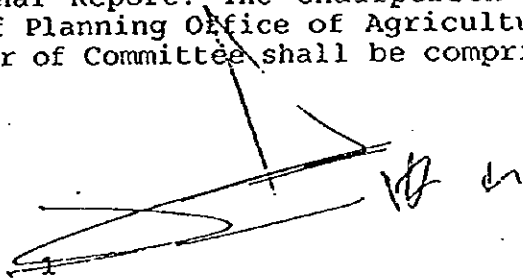
As the result of the discussion, MAG and the Team confirmed as follows:

1. With regard to the Scope of work-VII.4(3), expected fields of counterpart personnel are tentatively as follows;
 - Agriculture
 - Irrigation and Drainage
 - Social Forestry.
 - River Management
 - Farmers' Economy

One counterpart personnel is desired to be assigned in each field. Additional fields will be fixed at the beginning of Phase I of the Study.

2. With regard to the Scope of work-VII.4(4), MAG shall supply the Japanese study team for the works of the Study suitable office space equipped with electricity, water supply, and telephones at least.

- 3.A Steering Committee (hereinafter referred to as "the Committee"), for smooth and effective implementation of the Study in terms of technical and administrative aspects, shall be organized by relevant departments and organizations of the Government of El Salvador before beginning of the Study and should be held at least three times at the submission of Inception Report, Interim Report, and Draft Final Report. The chairperson of the Committee shall be Director of Planning Office of Agriculture and Livestock sector and the member of Committee shall be comprised of the following at least.

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Ministry of Agriculture and Livestock (MAG)

-Planning Office of Agriculture and Livestock sector (OSPA)

-General Directorate of Renewable Natural Resources (DGRNR)

-National Center of the Technology of Agriculture, Livestock and Forestry (CENTA)

Ministry of Foreign Affairs. Viceministry of External Cooperation.

General Directorate of Public Investment Administration.

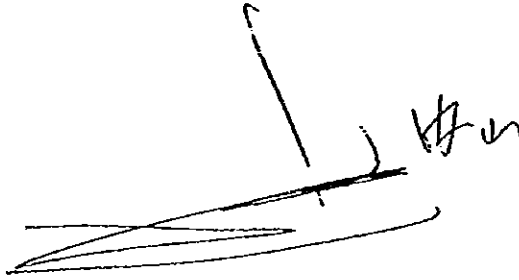
SEMA. (Executive Secretary of Environment)

4. MAG shall carry out, at own expense, water quality survey (including tests relating to Boron and Arsenic) and soil survey, if necessary

5. MAG requested the Team to provide following survey equipment. The Team promised to convey its request to the Government of Japan:
 - Meteorological survey equipment
 - Hydrological survey equipment
 - Photocopy machine

6. MAG requested the Team for a counterpart training in Japan. The Team promised to convey its request to the Government of Japan.

7. MAG shall provide necessary number of drivers, secretaries (who speak Spanish) and laborers.

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LIST OF PARTICIPANTS

NAME	POSITION	ORGANIZATION
Antonio Adolfo Villacorta G.	Technical Director	Planning office of Agriculture and Livestock Sector (OSPA)/MAG
Inés María Ortíz	General Director	General Directorate of renewable Natural Resources (DGRNR)/MAG
Anselmo Renderos Arévalo	Chief	External Cooperation and Sectorial Investment Division (OSPA)/MAG
Iván Orellana	Technical Officer of Projects	OSPA/MAG
Ana R. de Serrano	Technical Officer of External Cooperation	OSPA/MAG
Ramón García V.	Chief	Hydrology Division (DGRNR)/MAG
Martha Yvette de Aguilar	Chief	Planning Division (DGRNR)/MAG
Carlos Armando Valle Coto	Technical Officer	Planning Division (DGRNR)/MAG
José Antonio López	Technical Officer	Planning Division
Ana Deysi López	Chief	Hydrology Department (DGRNR)/MAG
Saúl Andrés Rodríguez	Technical	Hydrology Department (DGRNR)/MAG
Naoji Uchiyama	Team Leader	JICA
Koji Yamauchi	Hydrology	JICA
Yoshiro Higashi	Agriculture	JICA
Toshihiko Yamaoka	Agricultural Officer of External Cooperation	JICA
Kenichi Matsumoto	Coordinador	JICA
Yukari Koike	Interepreter	JICA

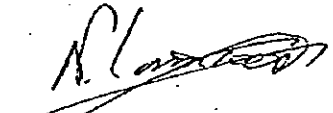
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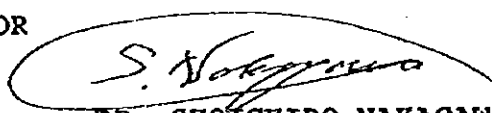
MINUTES OF MEETING
ON
THE INCEPTION REPORT
FOR
THE MASTER PLAN STUDY
ON
THE JIBOA RIVER BASIN
INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT
IN
THE REPUBLICA OF EL SALVADOR

AGREED UPON BETWEEN
THE MINISTRY OF AGRICULTURE AND LIVESTOCK
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

26th January 1996. San Salvador

~~MR. ANTONIO ADOLFO VILLACORTA GUANDIQUE
TECHNICAL DIRECTOR
PLANNING OFFICE OF AGRICULTURE
MINISTRY OF AGRICULTURE AND
LIVESTOCK
REPUBLIC OF EL SALVADOR~~


MR. NARUMI YAMADA
LEADER OF
MASTER PLAN STUDY
TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY


DR. SHOICHIRO NAKAGAWA
LEADER OF
ADVISOR COMMITTEE
JAPAN INTERNATIONAL COOPERATION AGENCY

In accordance with the Scope of Work for the Master Plan Study on the Jiboa River Basin Integrated Agricultural Development Project (hereinafter referred to as the Study) signed by the Government of the Republic of El Salvador (hereinafter referred to as the Government) and the Government of Japan on 5th. September, 1995, the Government of Japan dispatched a JICA Study Team.

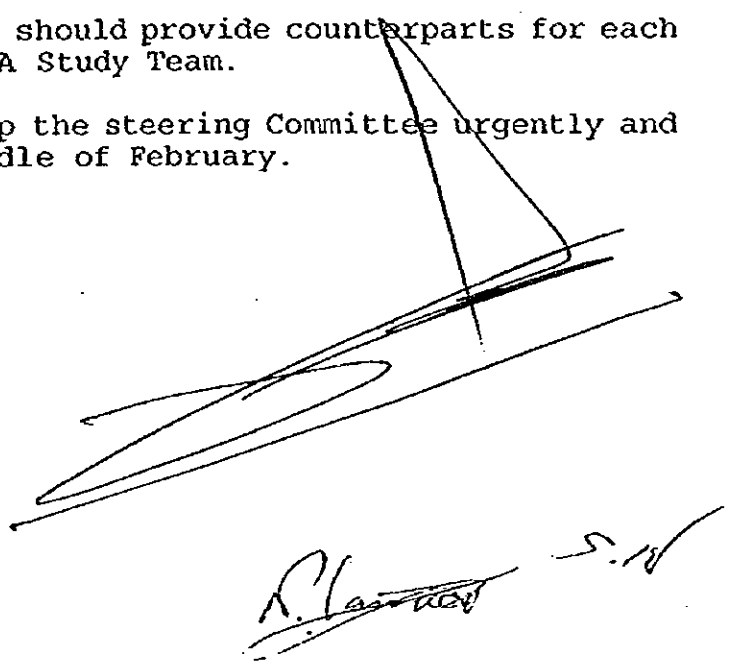
The JICA Study Team headed by Mr. Narumi YAMADA submitted and explained the Inception Report, under attendance of the JICA Advisory Committee headed by Dr. Shoichiro NAKAGAWA, to the Government with the presence of the El Salvador officials concerned headed by Mr. Antonio Adolfo Villacorta G., and an exchange of opinions on the Report was made between the El Salvador side and the Study Team on January 22, 1996.

As the consequence of the said explanation and an exchange of opinions, the following has been agreed between the El Salvador side and the Japanese Study Team:

1. The Government received from the Study Team ten (10) copies in Spanish and (5) copies in English of the Inception Report.
2. The Government has agreed with the contents of the Inception Report and study schedule.
3. It was confirmed to formulate a Master Plan for the integrated agricultural development project which gives priority to the conservation of the Jiboa River Basin.
4. It was confirmed that MAG should collect water quality data urgently.

MAG shall carry out analysis of water quality and soils which can be conducted by CENTA and Laboratory of Natural Resources, at own expense.

5. It was confirmed that MAG should provide counterparts for each assigned work of the JICA Study Team.
6. It was confirmed to set up the steering Committee urgently and to have a meeting by middle of February.



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LIST OF PARTICIPANTS

NAME	POSITION	ORGANIZATION
Antonio Adolfo Villacorta Guandique	Technical Director	Planning Office of Agriculture and Livestock Sector OSPA/MAG
Inés María Ortíz	General Director	General Directorate of Renewable Natural Resources DGRNR/MAG
Anselmo Renderos Arévalo	Chief	External Cooperation and Sectorial Investment Division OSPA/MAG
Iván Orellana Eguizábal	Technical Officer of Projects	OSPA/MAG
Ramón García Vásquez	Chief	Hydrology Division DGRNR/MAG
Martha Ivette de Aguilar	Chief	Planning Division DGRNR/MAG
Shoichiro Nakagawa	Leader of Advisory Mission	JICA
Hiroto Ryukoh	Social Forestry	JICA
Kenichiro Kobayashi	Administration	JICA
Narumi Yamada	Team Leader, Agricultura Infraestructura	JICA Study Team
Masahiro Tajima	Watershed Management	JICA Study Team
Hitoshi Kato	Social Forestry	JICA Study Team
Valerio Gutiérrez	Protection	JICA Study Team
Masaru Obara	Support System/ Farmers Organization	JICA Study Team
Harunobu Inoue	Farm Management/ Land Use	JICA Study Team
Zetsugaku Kurita	Environment	JICA Study Team

A. Clavero

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MINUTES OF MEETING
ON
PROGRESS REPORT I
FOR
THE MASTER PLAN STUDY
ON

THE JIBOA RIVER BASIN

INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT

IN
THE REPUBLIC OF EL SALVADOR

AGREED UPON BETWEEN


THE MINISTRY OF AGRICULTURE AND LIVESTOCK

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

13th March 1996. San Salvador

~~MR. ANTONIO ADOLFO VILLACORTA GUANDIQUE~~
~~TECHNICAL DIRECTOR~~
~~PLANNING OFFICE OF AGRICULTURE~~
~~MINISTRY OF AGRICULTURE AND~~
~~LIVESTOCK~~
~~REPUBLIC OF EL SALVADOR~~


MR. NARUMI YAMADA
LEADER OF
MASTER PLAN STUDY
TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

In response to request of the Government of the Republic of El Salvador (hereinafter referred to as "The Government"), the Government of Japan dispatched the Master Plan Study Team for the Jiboa River Basin Integrated Agricultural Development Project (hereinafter referred to as "The JICA Study Team") through the Japan International Cooperation Agency (JICA).

At the completion of the Field Work I of the Master Plan Study, the JICA Study Team headed by Mr. Narumi Yamada submitted ten (10) copies in Spanish and five (5) copies in English of the Progress Report I for the Study, on which the JICA Study Team explained and the view were exchanged between the Government officials concerned headed by Mr. Antonio Adolfo Villacorta G. and the Study Team.

1. The JICA Study Team explained the contents of the Progress Report I and further study schedule on 12th March, 1996.
2. The Government agreed with the contents of the Progress Report I.
3. The JICA Study Team requested to observe three the (3) water level staff gauges which the Study Team installed, and the Government agreed.
4. The JICA Study Team requested to keep a copy machine and other equipment necessary for the study in good condition, and the Government agreed.
5. The Government requested to carry out analysis of water quality at JICA's expense excepting items which can be conducted by CENITA and Laboratory of Natural Resources, the JICA Study Team promised to tell it to JICA.

Note.

Items which can be conducted by CENITA and Laboratory of Natural Resources (18 items)

(1) Temperature (2) Turbidity (3) Color (4) PH (5) EC (6) DO (7) CI (8) SO₄ (9) Ca (10) Mg (11) Mn (12) Na (13) K (14) NH₃ (15) TP (16) CO₃ (17) HCO₃ (18) RAS.

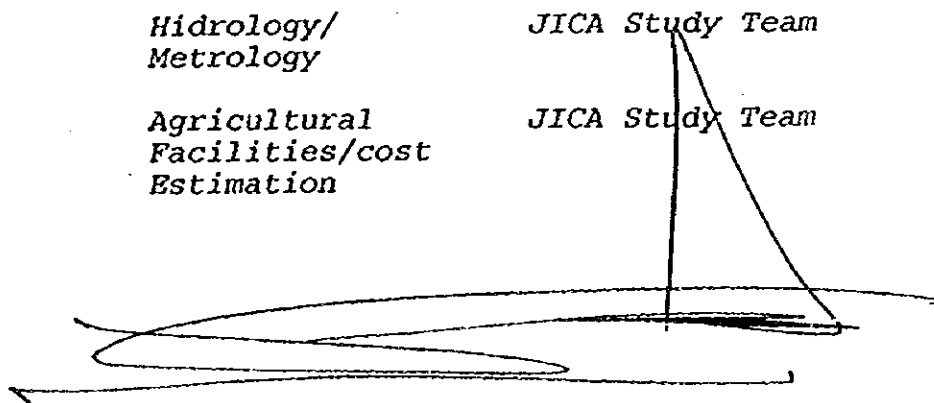
Items which can be conducted by FUSADES (17 item)

(1) Total Coliform (2) Hardness (3) NO₃ (4) NO₂ (5) As (6) Cr (7) Hg (8) Pb (9) Cd (10) B (11) COD (12) BOD (13) SS (14) TN (15) PO₄-P (16) Dissolved solids (17) Total Solids

Narumi Yamada

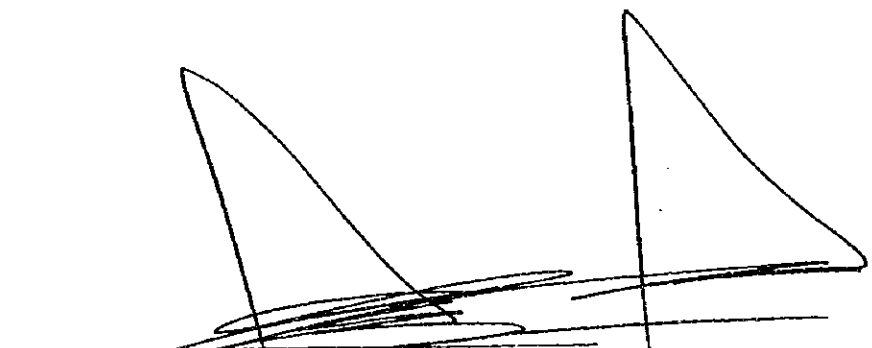
LIST OF PARTICIPANTS

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Antonio Adolfo Villacorta Guandique	Technical Director	Planning Office of Agriculture and Livestock Sector OSPA/MAG.
Manuel Rodríguez Cedillos	Technical Director	National Center of Agriculture and Livestock and Forest (CENTA)
Carlos Alberto Aguilar Molina	Executive Secretary for the Enviroment	Executive Secretary for Environment (SEMA)
Iván Orellana Equizábal	Technical Officer of Projects	OSPA/MAG
Ramón García Vásquez	Chief	Hydrology Division DGRNR/MAG
Narumi Yamada	Team Leader, Agricultura Infraestructura	JICA Study Team
Masahiro Tajima	Watershed Management	JICA Study Team
Hitoshi Kato	Social Forestry	JICA Study Team
Valerio Gutiérrez	Protection	JICA Study Team
Harunobu Inoue	Farm Management/ Land Use	JICA Study Team
Jun-ichi Usami	Agricultural Infraestructure	JICA Study Team
Katsuya Kamisato	Hidrology/ Metrology	JICA Study Team
Sakuzo Kanazawa	Agricultural Facilities/cost Estimation	JICA Study Team





MINUTE OF MEETING
ON
INTERIM REPORT
FOR
THE MASTER PLAN STUDY
ON
THE JIBOA RIVER BASIN
INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT
IN
THE REPUBLIC OF EL SALVADOR
AGREED BETWEEN
THE MINISTRY OF AGRICULTURE AND LIVESTOCK
AND
JAPAN INTERNACIONAL COOPERATION AGENCY

26 th August 1996. San Salvador



Mr. ANTONIO ADOLFO VILLACORTA GUANDIQUE
TECHNICAL DIRECTOR
PLANNING OFFICE OF AGRICULTURE
MINISTRY OF AGRICULTURE AND
LIVESTOCK
REPUBLIC OF EL SALVADOR



Mr. NARUMI YAMADA
LEADER OF
MASTER PLAN STUDY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

吉田 豊
Mr. SATOSHI YOSHIDA
ADVISORY MISSION
JAPAN INTERNATIONAL COOPERATION AGENCY

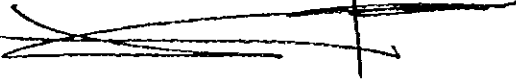
The team for the study on the Jiboa River Basin Integrate Agricultural Development Project (hereinafter referred to as "the Study Team") presented to the Ministry of Agriculture and Livestock (hereinafter referred to as "MAG") and discussed on the contents of the Interim Report with the officials and the Streering Committee concerned at MAG office, on August 21, 1996.

During the meeting, Mr. Antonio Adolfo Villacorta Guandique, the Technical Director for the Planning Office of Agriculture and Livestock of MAG, representing the Ministry of Agriculture and Livestock, expressed that the Salvadorean counterpart basically agreed with the contents of the Interim Report.

The Government will inform the comments on the pilot areas and discuss with study team as soon as possible.

The list of participants is shown in Annex enclosed.

NY.

SY 

ANNEX

LIST OF PARTICIPANTS

NAME	POSITION	ORGANIZATION
Antonio Adolfo Villacorta G.	Technical Director	Planning Office of Agriculture and Livestock Sector (OSPA/MAG)
Inés Marfa Ortíz	Director General	Direction of Natural Renewable Resources (DGRNR/MAG)
Iván Orellana Eguizabal	Technical Officer of Projects	OSPA/MAG
Alejandro Flores	Chief of Division	Division of Irrigation and Drainage, (DGRNR/MAG)
Martha Yvette de Aguilar	Chief of Dept.	Dpto. Of Planning (DGRNR/MAG)
Elizabeth de Fuentes	Executive Assistant Gral.	Direction of Foreign Cooperation (MIREX)
José Gustavo Reyes	Technical Officer of Sector	DAIP/MIREX
Manuel Rodríguez Cedillos	Technical Director	National Center of Agriculture and Forestry Technology (CENTA)
Carlos Aguilar Molina	Technical in Environmental	Secretary of Environment Policies (SEMA)
Mario E. Lobo	Chief of Service	Service of Watershed Ordering (DGRNR/MAG)
Roberto Hernández Navas	Counterpart	DGRNR/MAG
Oscar Alberto Martínez	Counterpart	DGRNR/MAG
Satoshi Yoshida	Advisory Mission	JICA
Narumi Yamada	Chief/Rural Infrastructure	JICA Study Team
Masahiro Tajima	Watershed Management	JICA Study Team
Hitoshi Kato	Social Forestry	JICA Study Team
Valerio Gutiérrez	Protection Works	JICA Study Team
Harunobu Inoue	Land Use/Agriculture	JICA Study Team
Naoaki Shibasaki	Hydrogeology	JICA Study Team
Jun-ichi Usami	Agricultural Infrastructure	JICA Study Team
Katsuya Kamisato	Hidrology/ Climatology	JICA Study Team

San Salvador, 09th of September, 1996

Regarding: Jiboa River Basin Study.

Mr. Narumi Yamada
Study Team Leader
Jiboa River Project.
Present.

On meeting held on September 3rd of the current year, at the auditorium of the General Directorate of Renewable Natural Resources (DGRNR); gathered the Japan's Study Team and Counterparts, discussed the Interim Report reaching the following conclusions:

- 1- To accept in first hand the established pilot areas, San Cristobal, San Antonio Masahuat and San Pedro Masahuat, according to the methodology applied by the Study Team.
- 2- Propose as specific project the sub-basin of the Ilopango Lake that involves 14 municipios and is an integral part of the Jiboa River Basin; this is due to the multiple problems shown, specially on the following components: deforestation, low production yield, high level of erosion, high level of sedimentation, poor conditions of roads, threat upon protected areas, fluvial pollution, not adequate conditions in human settlements, deficient peasants and women organization, deficient potable water supply, low technical assistance, etc.

In this regard this Directorate concurs with the conclusions and recommendations agreed upon the mentioned meeting.

Sincerely.

GOD, UNION, LIBERTY

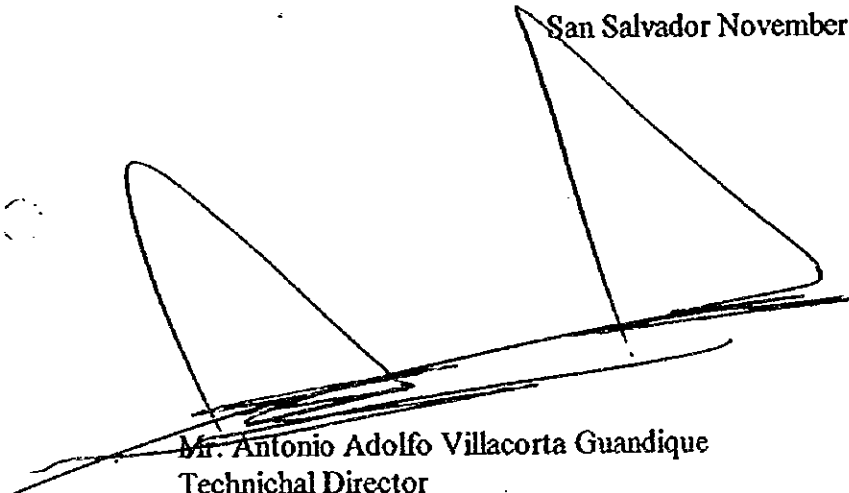
Lic. Antonio Villacorta Guandique
Technical Director.

Continuous Copy to Ines Maria Ortiz at DGRNR

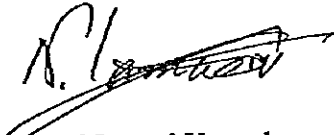
**MINUTES OF MEETING
ON
PROGRESS REPORT II
FOR
THE MASTER PLAN STUDY
ON
THE JIBOA RIVER BASIN
INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT
IN
THE REPUBLIC OF EL SALVADOR**

**AGREED UPON BETWEEN
THE MINISTRY OF AGRICULTURE AND LIVESTOCK
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY**

San Salvador November 4th. 1996



**Mr. Antonio Adolfo Villacorta Guandique
Technical Director
Agricultural Sector Planning Office
Ministry of Agriculture of**

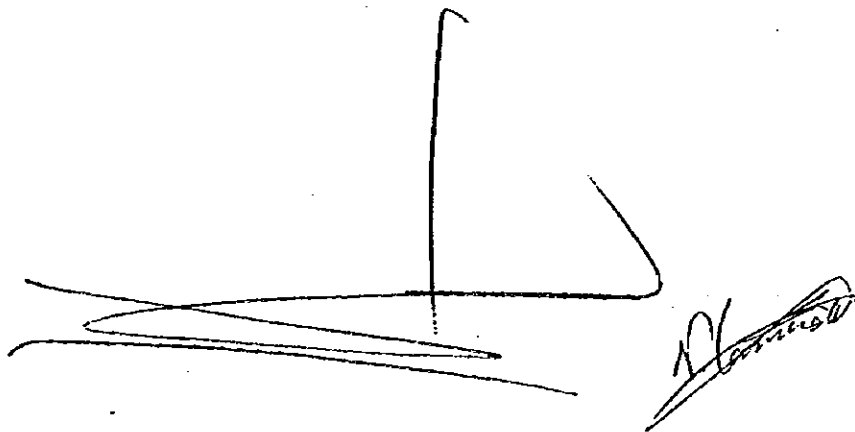


**Mr. Narumi Yamada
Study Team Leader
Japan International
Cooperation Agency**

At the Completion of the Field Work II of the Master Plan Study, the team for the Jiboa River Basin Integrated Agricultural Development Project (hereinafter referred to as "the Study Team") submitted ten (10) copies in Spanish and five (5) in English of the Progress Report II for the Study, on which the Study Team explained exchanged opinions between the Steering Committee, Government Officials concerned and the Study Team on November 1st, 1996.(Attendant list included).

1. In Consideration with the discussion of the process for the observations presented on the explanation meeting for the Progress Report II, the Government of El Salvador agreed with the content of the Progress Report II.

2. The Study Team requested to keep the Copy machine under well maintenance until the completion of the Study, and the Government agreed.

A large, stylized handwritten signature or scribble is present, consisting of several overlapping horizontal and vertical lines. To the right of this main scribble is a smaller, more legible signature that appears to read "M. ...".

ATTENDANT LIST

/

LISTA DE ASISTENCIA.

Ing. Manuel Rodriguez Cedillos	On behalf of C.E.N.T.A. Director
Ing. Yukihide Fuse	JICA Representative at Foreign Affairs Ministry
Lic. Doves de Urbina	On Behalf of Lic. Ivan Orellana/OSPA
Ing. Gustavo Reyes	Public Investment Directorate at Foreign Affairs Ministry (MIREX/DAIP)
Ing. Carlos Aguilar Molina	Executive Secretariat for the Environment (SEMA).
Ing. Ines Maria Ortiz	D.G.R.N.R. Director.
Ing. Alejandro Flores	Irrigation and Deirage Division Chief/Counterpart Chief (D.G.R.N.R.)
Roberto Handal	On behalf of Natural Resources Division Chief. (D.G.R.N.R.)
Lic. Leonardo Merlos Ventura	Hydrology and Meteorology Division Chief (D.G.R.N.R.)
William Enrique Rivas	Counterpart/Contraparte
Douglas Soriano	Counterpart/Contraparte
Saul Rodriguez	Counterpart/Contraparte
Alirio Rosas	Counterpart/Contraparte
Jose Leonardo Donado	Counterpart/Contraparte
Oscar Martinez	Counterpart/Contraparte
Francisco Jacobo Somoza	Counterpart/Contraparte
Santiago Milian	Counterpart/Contraparte
Roberto Hernandez Navas	Counterpart/Contraparte
Maria Isaura Avalos	Counterpart/Contraparte
Cecilia Lopez	Counterpart/Contraparte
Carlos Perez Funes	Counterpart/Contraparte
Mario Ernesto Lobo	Counterpart/Contraparte
Yolanda de Milian	Counterpart/Contraparte
Ramon Garcia Vasquez	Counterpart/Contraparte

Lic Orlando Romero

Public Relations/Communications Department

Jefe, Dpto. Comunicaciones

Ri Uchizawa

JOCV. Voluntario Japonés

JICA Study Team:

Narumi Yamada

Chief of Study Team/Jefe Equipo de Estudio

Masahiro Tajima

Watershed Management/Manejo de Cuencas

Valerio Gutiérrez

Protection Works/Obras de Protección

Harunobu Inoue

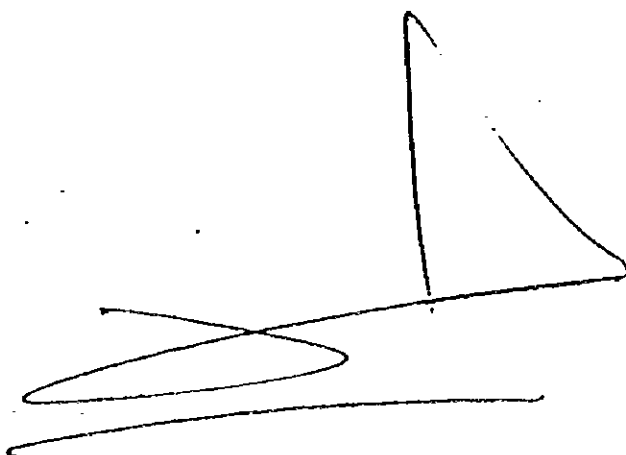
Land Use/Usos de la Tierra

Zetsugaku Kurita

Environment/Livestock/Medio Ambiente/Ganadería

Sakuzo Kanazawa

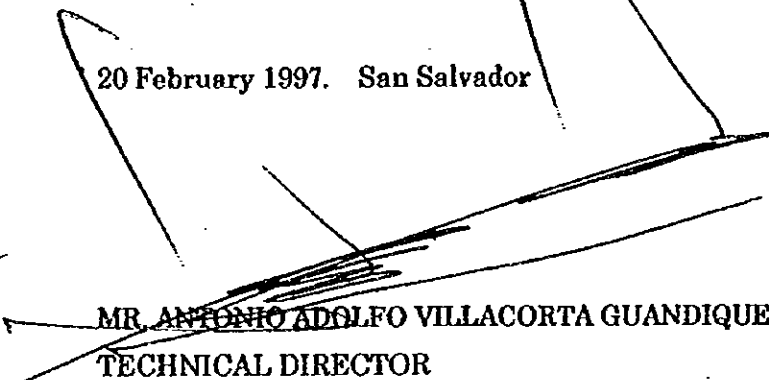
Costs Estimations/Estimación de Costos.




MINUTES OF MEETING
ON
DRAFT FINAL REPORT
FOR
THE MASTER PLAN STUDY
ON
THE JIBOA RIVER BASIN
INTEGRATED AGRICULTURAL
DEVELOPMENT PROJECT
IN
THE REPUBLIC OF EL SALVADOR

AGREED UPON BETWEEN
THE MINISTRY OF AGRICULTURE AND LIVESTOCK
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

20 February 1997. San Salvador


~~MR. ANTONIO ADOLFO VILLACORTA GUANDIQUE~~
TECHNICAL DIRECTOR
PLANNING OFFICE OF AGRICULTURE
MINISTRY OF AGRICULTURE AND LIVESTOCK
REPUBLIC OF EL SALVADOR


~~MR. NARUMI YAMADA~~
LEADER OF
MASTER PLAN STUDY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY


MR. KEIZO EGAWA
ADVISORY MISSION
JAPAN INTERNATIONAL COOPERATION AGENCY

In accordance with the Scope of Work for the Master Plan Study on the Jiboa River Basin Integrated Agricultural Development Project, the Japanese Study Team officially presented twenty (20) copies in Spanish and five (5) copies in English of the Draft Final Report, on which the Study Team explained and points of view were exchanged between the Steering Committee and the Government officials concerned and the Study Team on 18 February 1997.

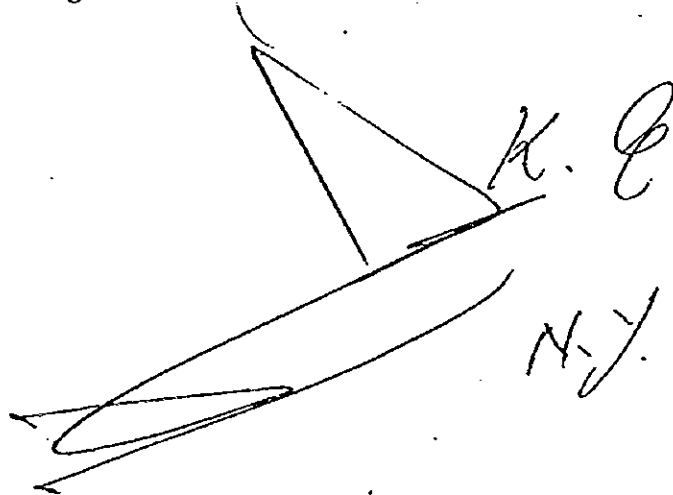
The following are the points agreed upon between both sides.

1. The El Salvador side will prepare the written comments on the Draft Final Report and send to JICA Head Office through the Embassy of Japan. The Comments should arrive JICA Head Office not later than March 17, 1997, Japanese Time.

2. In case any divergency arises about interpretation of the Draft Final Report and this Minutes of Meeting which were prepared in English and Spanish, the English text shall prevail.

3. As for the Final Report, both sides agreed to make it open to the public in accordance with the relevant laws and regulations in force in each country.

On behalf of members of the Japanese Study Team and himself, Mr. Yamada expressed most sincere appreciation for kind assistance and support rendered to the Japanese Study Team by the El Salvador side and other government authorities concerned.



The image shows a large, dark, scribbled-out signature or stamp. To the right of the scribble, there are two handwritten initials: "K. E." in the upper right and "N. Y." in the lower right.

LIST OF PARTICIPANTS

Sr. Antonio Adolfo Villacorta
Srta. Inés María Ortíz
Sr. Roberto Molina Castro
Sr. Alejandro Flores Bonilla

Sr. José Gustavo Reyes
Sr. Carlos Aguilar Molina
Sr Iván Orellana Eguizábal
Sr. Leonardo Merlos

Sr. Alirio Rosas
Sra. Ivette de Aguilar
Sra. Celina Mena
Sr. Raúl Murillo
Sr. Hugo A Lone
Sr. Ramón García Vásquez
Sr. Carlos Romeo Pérez Funes
Sr. José Leonardo Donado
Sr. Douglas Vladimir Soriano
Sr. Oscar Alberto Martínez
Sr. José Roberto Navas
Sr. Santiago Milián Morataya
Sra. María Isaura Avalos
Sra. Yolanda de Milián
Sr. Francisco Jacobo Somoza
Sr. William Enrique Rivas
Sr. José Orlando Romero Toledo
Sr. Ramón Guzmán
Sr. Ri Ushizawa
Mr. Yukihide Fuse

Mr. Keizo Egawa
Mr. Narumi Yamada
Mr. Masahiro Tajima

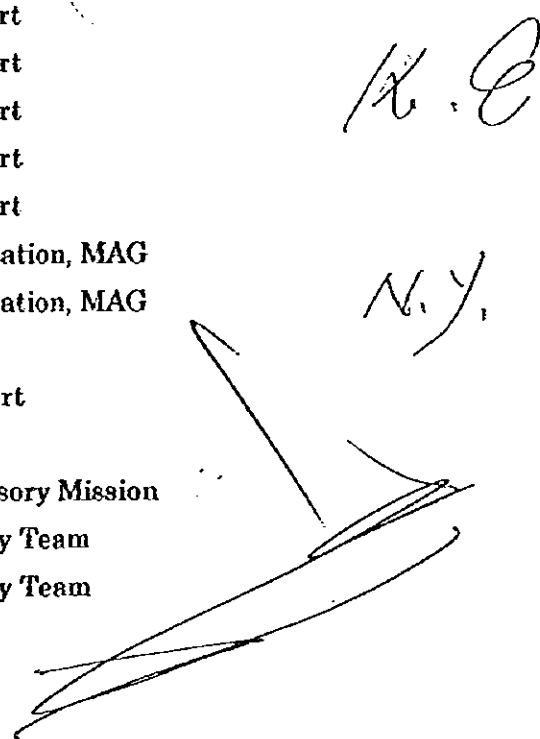
LISTA DE PARTICIPANTES

Technical Director, OSPA, MAG
Director, DGRNR
Technical Director, CENTA
Irrigation and Drainage Division Chief,
DGRNR, MAG
Ministry of Finance
SEMA
OSPA, MAG
Meteorology and Hydrology Division Chief,
DGRNR, MAG
Meteorology and Hydrology Division, DGRNR
Planning Sec. Chief, DGRNR, MAG
Hydrology Sec. Chief, DGRNR, MAG
Meteorology Sec. Chief, DGRNR, MAG
Hydrology Sec. DGRNR, MAG
Former Counterpart, DGRNR, MAG
Forestry Div. DGRNR, MAG
Counterpart
Counterpart
Counterpart
Counterpart
Counterpart
Counterpart
Counterpart
Counterpart
Counterpart
Communication, MAG
Communication, MAG
JOCV
JICA Expert

JICA Advisory Mission
JICA Study Team
JICA Study Team

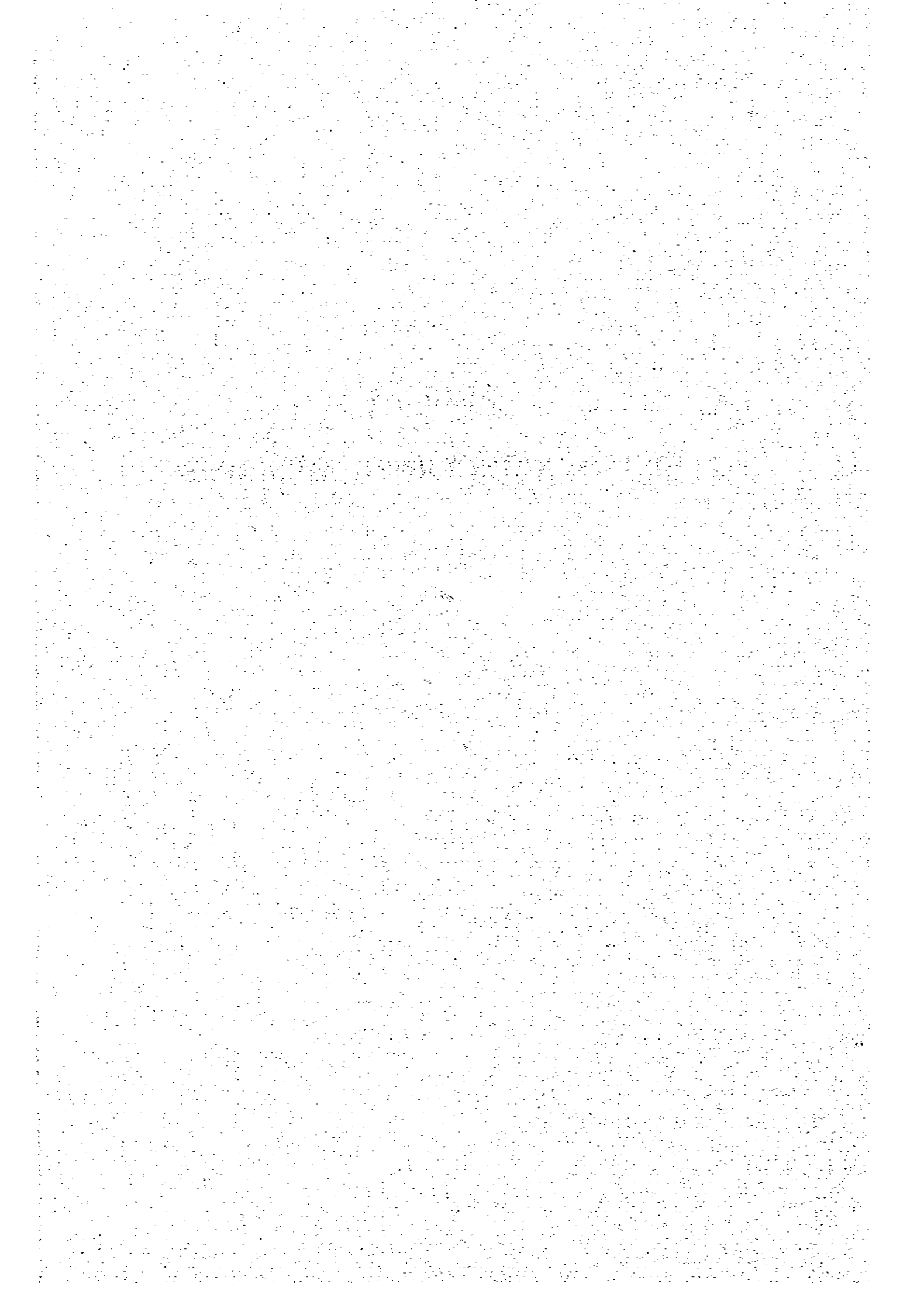
H. E.

N. Y.



ANNEX 3

LIST OF CONCERNED MEMBERS



List of Members of the Japanese Mission

Advisory Committee

Dr. Shoichiro Nakagawa.....	Advisory Committee Leader
Dr. Hiroto Ryuko.....	Social Forestry
Mr. Toshihiko Yamaoka.....	Agricultural Infrastructure / Protection Works
Mr. Yoshihiro Higashi.....	Farm Management / Farmer's Organization

Study Team

Mr. Narumi Yamada.....	Team Leader / Rural Infrastructure
Mr. Masahiro Tajima.....	Watershed Management
Mr. Hitoshi Kato.....	Social Forestry
Dr. Valerio Gutierrez.....	Protection Works
Dr. Masaru Obara.....	Support System / Farmer's Organization
Mr. Harunobu Inoue.....	Farm management / Land Use
Mr. Junichi Usami.....	Agricultural Infrastructures
Mr. Hirohisa Omori.....	Agricultural Economy / Project Evaluation
Mr. Katsuya Kamisato.....	Hydrology / Meteorology
Mr. Zetsugaku Kurita.....	Environment / Livestock / Inland fishery
Mr. Sakuzo Kanazawa.....	Agricultural Facilities / Cost Estimation
Mr. Naoaki Shibasaki.....	Hydrogeology
Mr. Kazuo Furukata.....	Supervisor of Aerial Photography / Topography

List of Members of the El Salvadorian Counterpart Personnel

Steering Committee

Sr. Antonio Adolfo Villacorta.....	Technical Director, OSPA/MAG
Srta. Inés María Ortiz.....	Director, DGRNR/MAG
Sr. Roberto Molina Castro.....	Technical Director, CENTA
Sr. Manuel Rodríguez Cedillos.....	Technical Director, CENTA
Sr. Alejandro Flores Bonilla.....	Chief of Irrigation and Drainage Division. DGRNR/MAG
Sr. Ramón García Vásquez*.....	Chief of Watershed Management Division
Sr. José Gustavo Reyes.....	Ministry of Finance
Sr. Carlos Aguilar Molina.....	SEMA
Sra. Ivette de Aguilar.....	Chief of Planning Section. DGRNR/MAG
Sr. Iván Orellana Eguizábal.....	OSPAMAG

Counterpart

Sr. Alejandro Flores Bonilla.....	Counterpart Coordination Chief of Irrigation and Drainage Div. DGRNR/MAG
Sr. Ramón García Vásquez*.....	Counterpart Coordination Chief of Watershed Management Div. DGRNR/MAG
Sr. William Enrique Rivas.....	Watershed Management. DGRNR
Sr. José Roberto Navas.....	Protection Works. DGRNR
Sr. Ernesto Lobo Mejía *.....	Protection Works DGRNR
Sr. Santiago Milián Morataya.....	Social Forestry. DGRNR
Sr. Carlos Romeo Pérez Funes*.....	Social Forestry. DGRNR
Sr. José Leonardo Donado.....	Aerial Photography, Topography and Mapping. DGRNR
Sr. Douglas Vladimir Soriano.....	Rural Infrastructure. DGRNR
Sr. Oscar Alberto Martínez.....	Agricultural Economy/Project Evaluation. DGRNR
Sra. María Isaura Avalos.....	Environment. DGRNR
Sra. Ana Cecillia Peña de López*.....	Environment. DGRNR
Sra. Yolanda Mancía de Milián.....	Rural Facilities/Cost Estimation. DGRNR
Sr. Saúl A Rodríguez.....	Meteorology and Hydrology. DGRNR
Sr. Alirio Rosas Santos.....	Meteorology and Hydrology. DGRNR
Sr. Francisco Jacobo Somoza.....	Farmers Organization/Assistance System. CENTA
Sr. José Luis Guillén.....	Farmers Organization/Assistance System. CENTA

*. Former Counterpart.

Others

Sr. Leonardo Merlos..... Chief of Meteorology and Hydrology Division
DGRNR

Sra. Celina Mena..... Chief of Hydrology Section. DGRNR

Sr. Raúl Murillo..... Chief of Meteorology Section. DGRNR

Sr. Hugo A. Lone..... Hydrology Section. DGRNR



JICA