

# Outline of Development Studies in the Area of Agriculture, Forestry and Fisheries

F.Y 2000

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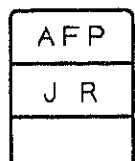
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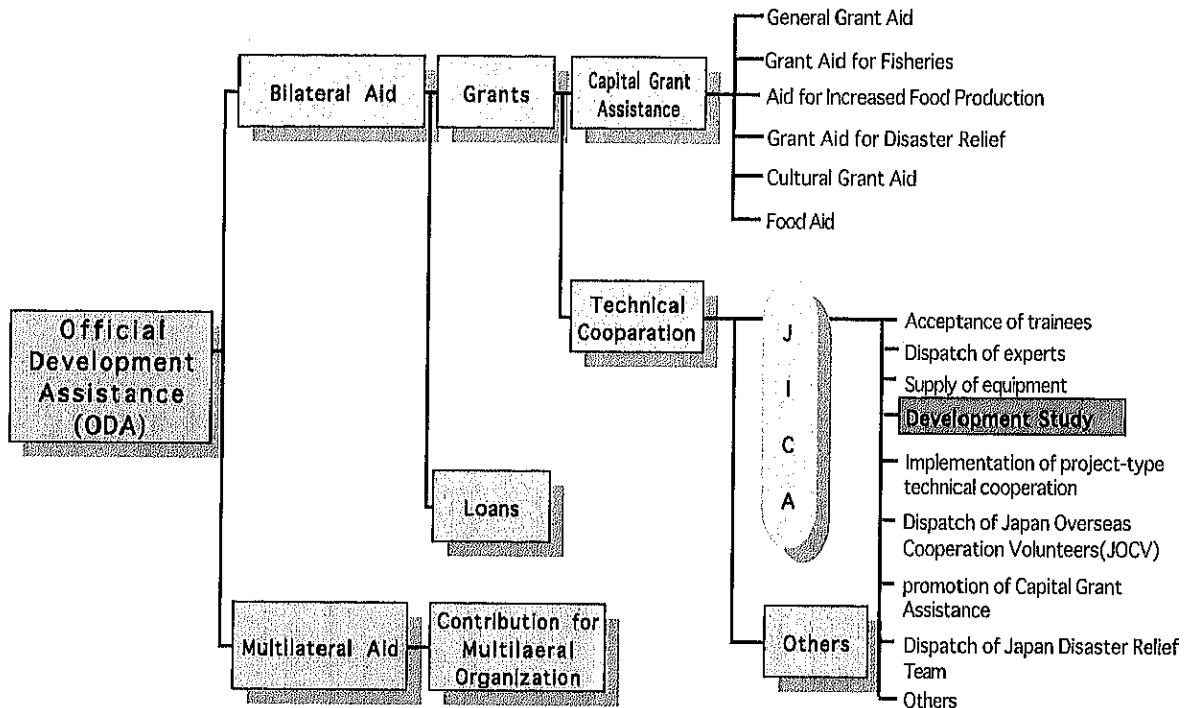
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Japan's ODA mainly consists of grants and loans. Grants cover capital grant assistance and technical assistance which includes the dispatch of experts, the acceptance of trainees and the supply of equipment. The development study is one form of technical cooperation and its intention is to assist the planning of urgent and high priority development projects through the preparation of relevant reports.

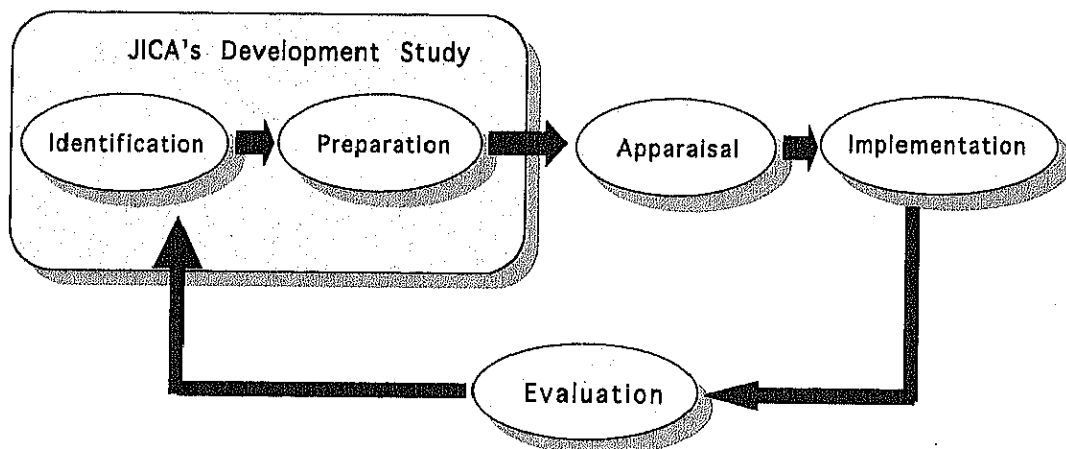
### Japan's ODA



Since development study can be conducted in various fields, the contents vary accordingly. In general, a development project consists of the following phases. ①Identification(Finding & Formulation)→②Preparation→③Appraisal→④Implementation→⑤Evaluation→⑥Identification this chain is usually called the project cycle as the evaluation results of and experience obtained in the course of project implementation are utilized for the identification/preparation/implementation of new projects.

Development studies conducted by JICA relate to phase ① and Phase ② where the backbone for project implementation is formed.

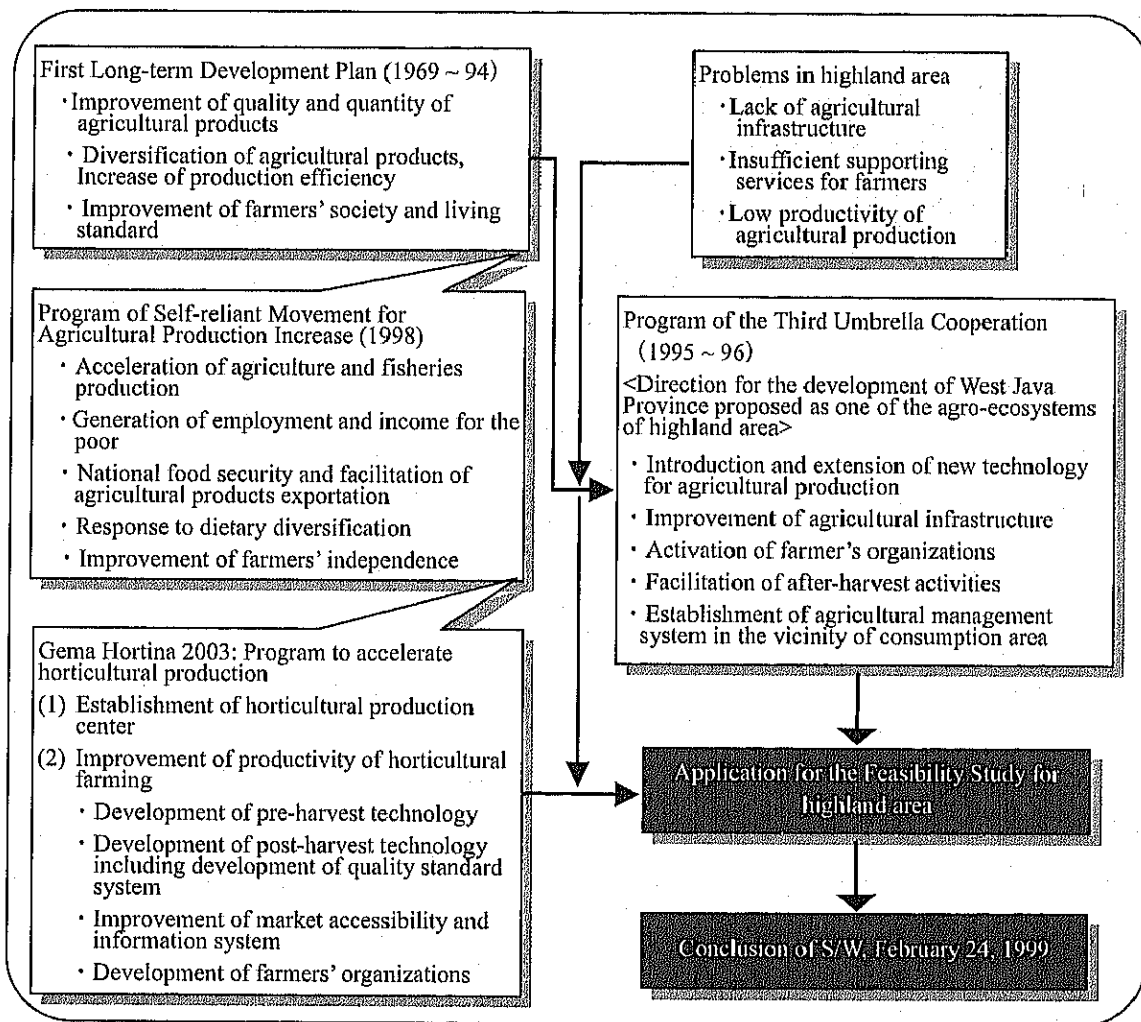
### [Project Cycle]



<b>The Feasibility Study on Integrated Agricultural and Rural Development in Highland Area</b>	Counterpart Agency	Directorate General of Food Crops and Horticulture (DGFCH)
	Consultant Companies	Nippon Koei Co., Ltd / Hokkaido Engineering Consultants Co., Ltd.
	Team Leader	Hiroshi KURONUMA
	Study Period	1999.9.7~2000.6.30
	Study Type	Feasibility Study

**Background of the Study**

Based on its Long-term Development Plan, the Government of Indonesia has been implementing a series of development plans including a program to accelerate horticultural production to improve people's food dietary. In 1995, the highland area in West Java Province was specified as one of the regional project areas by the Program of the Third Umbrella Cooperation in cooperation with the Japanese Government. The Program proposed general directions for the development of this area. Despite these efforts, productivity of horticultural crops remains low. In this context, the Government of Indonesia made a request to the Government of Japan for a Development Study for the F/S on agricultural development plan for the highland area. In response, the Government of Japan sent a preliminary study mission, and concluded the Scope of Works (S/W) for the Study on February 24, 1999, after discussions between both Governments.



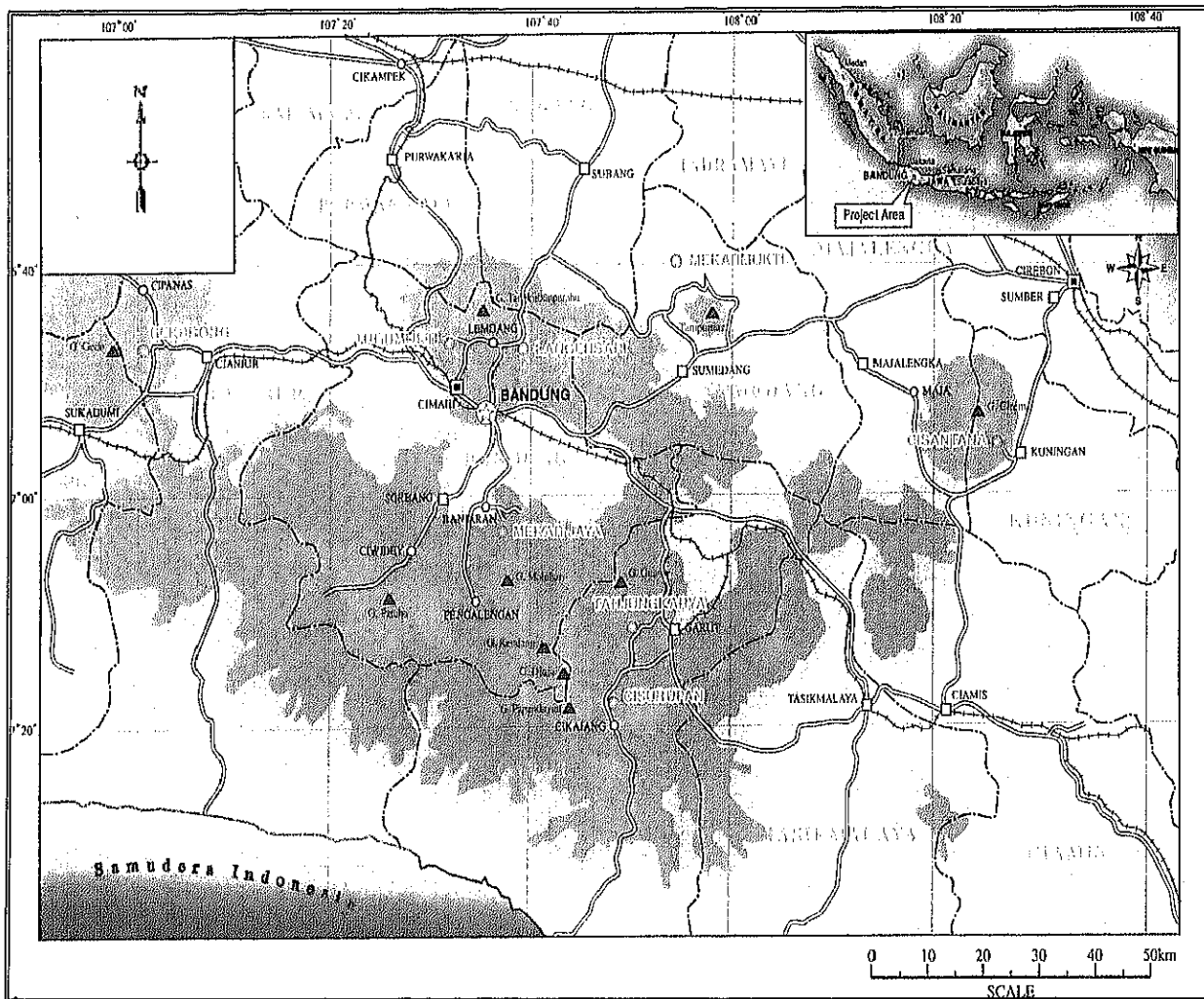
**Objectives of the Study**

- (1) As a model for further upland agriculture development, conducting the Feasibility Study on the integrated agricultural and rural development plan for selected model areas in highland, which includes maintenance of small scale upland irrigation facilities and farming plan to develop upland agriculture by promoting upland field cropping.
- (2) To transfer technology to the Indonesian counterpart personnel during the Study.

**Study Area**

(1) Consists of 8 model areas in 5 districts of West Java Province as follows  
 (Mekarjaya, Langensari, Tugumukti, Gekbrong, Cisurupan, Tanjungkarya, Mekarmukti, and Cisantana Area: Total Study area: 1,069 ha)

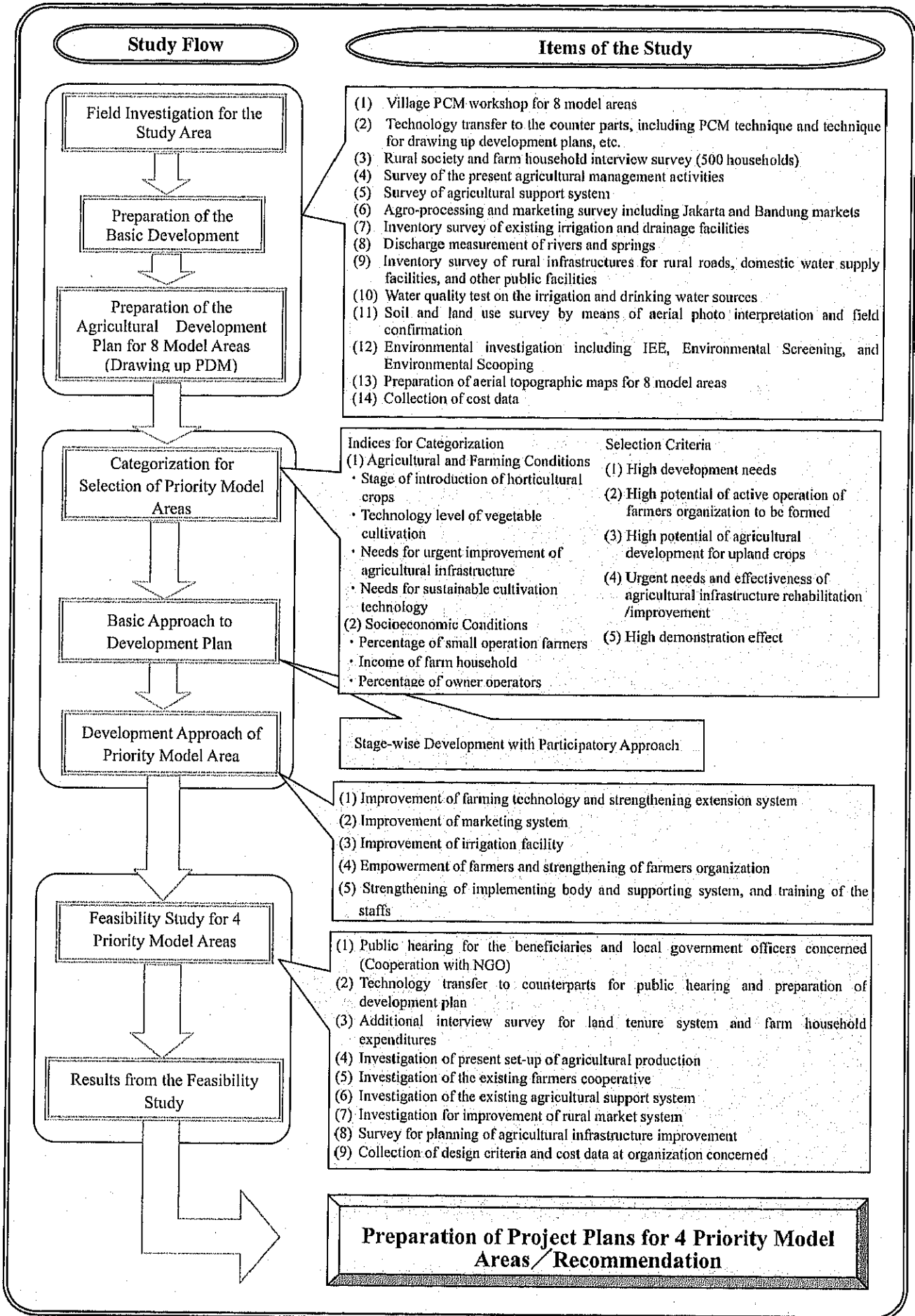
**Location Map**



**LEGEND**

	Capital of Province
	Capital of Kabupaten
	Kotamadya-Administrative
	Other City
	Project Area
	Mountain
	Road
	Railway
	Boundary
	El. 1500m
	El. 700m

## Study Items and Flow



## Outline of the Plan

### Summary of the Plan

- (1) Target Group Farmers in the model area
- (2) Overall Goal Extension of the model development in highland area to other highland potential area
- (3) Objective of the Plan Improvement of the farmers' income and living standard through promotion of vegetable cropping
- (4) Proposed Plans ① Agriculture and horticulture development plan ② Improvement plan of horticulture farming technology and extension system ③ Market system improvement plan ④ Activation plan of farmers organization ⑤ Agricultural and rural infrastructure development plan ⑥ Education and training plan ⑦ Environmental monitoring
- (5) Main Projects ① Establishment of Adaptive Trial Farm (ATF) ② Improvement of marketing system ③ Agriculture and rural infrastructure development ④ Education, training and operation and management
- (6) Expected Results 1) Improvement of vegetable production  
2) Improvement of marketing system of vegetable products  
3) Activation of farmers' organizations in agricultural production
- (7) Target Year 5 years after the commencement of the project work

### Target Area & Plan

Target Area: 4 Priority Model Areas

Category	Name of Area	Characteristic	Area (ha)
1	Mekarjaya	Crop diversification for the poor	100
2	Tanjungkarya	Introducing improved production technology	130
3	Gekbrong	Urgent improvement of agricultural infrastructures	80
4	Langensari	Introducing sustainable agricultural technology	72

### Agriculture and Horticulture Development Plan

- (1) Improving farming technology (shifting cropping pattern/vegetable production, quality improvement, marketability, prevention of continuous cropping injury, countermeasure to soil erosion, reduction of production cost, environmental/health conservation)
- (2) Deciding cropping plan and variety through discussion of farmers group
- (3) Reducing production cost by compost production (using straw)
- (4) Introducing soil erosion countermeasure (installment of civil facilities and introducing mixed and relay cultivation)
- (5) Total production and production value at target year is estimated as follows.

	Cropped area (ha)	Production (ton)	Production value (mil. Rp.)		
			Production value	Production cost	Profit
Vegetables	662	10,831	14,181	7,246	6,935
Paddy	54	243	340	187	153
Total	716	-	14,521	7,433	7,088

### Improvement Plan of Extension System for Horticulture Farming Technology

Extension activities will be strengthened by constructing technology development/extension system at three strata of provincial/district/field level (contents of technology: vegetable cultivation, marketing, post-harvest, extension services for living standard improvement)

- (1) Provincial task team: preparation of guideline on field school and demo-plot, providing technical guidance/training to district task team
- (2) District task team: preparation of action plan, operation and management of field farmers school and demo-plot, training for PPL\*1·NGO
- (3) PPL, NGO: extension activities in the field, establishment of demo-plot (new vegetable varieties/cropping, improved farming technology)

\*1 PPL: Agricultural Field Extension Officer (Penyuluh Pertanian Lapangan)

### Market System Improvement Plan

- (1) Establishing/improving collection centers and installing necessary facilities and equipment
- (2) Improving post-harvest handling technology from harvesting to loading for transportation to market
- (3) Operation and maintenance of collection centers will be managed by farmers group (post-harvest handling procedure/operation and maintenance, joint shipping)

**Activation Plan of Farmers' Organization**

- (1) Establishing / developing farmers' cooperative. Supporting activation of production and economic activities
- (2) Establishing water users group for operation and maintenance of irrigation facilities constructed by the project
- (3) Providing education/training for operation of farmers' organization

**Agricultural and Rural Infrastructure Development Plan**

- (1) Developing irrigation facilities (operation and maintenance by beneficiaries, improving irrigation efficiency, introduction of irrigation system appropriate for vegetable cultivation )
- (2) Improving rural market road (market access road, utilization of road for irrigation system management)
- (3) Developing water supply facilities in Gekbrong and Langensari

**Training and Education Plan**

- (1) Provincial task team and external experts provide education/training to district task team
- (2) Provincial task team and external experts provide training to village facilitators
- (3) District task team provides education and training to farmers/farmers' groups/farmers' organizations.

**Environmental Monitoring**

- (1) Water pollution in drainage and groundwater should be monitored 2 or 3 times per year by task teams/agricultural service offices in the district.
- (2) District agricultural service offices should monitor the following items 1 or 2 times per year for understanding other effects induced by the agrochemical application: residual of agrochemical on vegetable products and its soil contamination, residual of fertilizer, current situation and farmers' intention on agrochemical usage, impact on peoples' health.

**Project Plans**

**1. Establishment and Operation Plans of Adaptive Trial Farm (facilities/equipment & machines)**

Farm size	0.7 ha (six farm plots, 20m × 50m each) (Margahayu Main Seed Production Farm, Lembang sub-district in Highland Area)
Irrigation system	Drip irrigation with polyethylene pipe
Water source	Existing deep tube well (90m), electric submersible pump to be replaced (upgraded)
Related facilities	Lecture house and storage cum workshop
Equipment & machines	Training equipment (OHP, copy machine, television, video player, video camera, etc.), hand tractor (8.5HP), Light farming tools

**2. Marketing System Improvement (Collection Center Improvement Plan)**

Item	Mekarjaya	Tanjungkarya	Gekbrong	Langensari
Number of Centers	2	5	3	2
Capacity (area) of Platform	40m <sup>2</sup>	34m <sup>2</sup>	34m <sup>2</sup>	56m <sup>2</sup>
Proposed Facilities (common)	<ul style="list-style-type: none"> <li>• Platform (for sorting, packing, storage)</li> <li>• Washing place (9m<sup>2</sup>)</li> <li>• Bathroom</li> <li>• Office cum equipment stock (9 m<sup>2</sup>)</li> </ul>	<ul style="list-style-type: none"> <li>• Indoor storage (9m<sup>2</sup>)</li> <li>• Furniture</li> <li>• Scale</li> <li>• Facsimile</li> </ul>	<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Water supply</li> <li>• Parking space</li> <li>• Space for keeping deposit</li> </ul>	

**3.1 Agricultural and Rural Infrastructure Development (Irrigation Improvement Plan)**

Item		Mekarjaya	Tanjungkarya	Gekbrong	Langensari
Improvement Plan	Irrigation Area	83ha	77ha	50ha	58ha
	Water source	River/stream	Spring, river/stream	River/stream	Spring, river/stream
	Intake facilities	Weir	Diversion at existing channels/streams, intake box	Weir	Pump (potable, electric), weir, intake box
	Storage facilities	Farm pond (3)	None	Farm pond (1)	Farm pond (2)
	Conveyance & distribution system	PVC pipeline (open type and semi-closed type)	Open channel	PVC pipeline (open type and semi-closed type)	PVC pipeline (closed type), open channel
	Field application	Bucket, hose	furrow	Bucket, hose	Bucket, hose, furrow

### 3.2 Agricultural and Rural Infrastructure Development ( Rural Market Road Improvement Plan)

Item	Mekarjaya	Tanjungkarya	Gekbrong	Langensari
Improvement Plan	<ul style="list-style-type: none"> <li>Improvement of 2300m from the village to the district road via adjacent villages</li> <li>Improvement of 1400m of main village road</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitation of existing road (400m) and construction of new road (800m)</li> </ul>	<ul style="list-style-type: none"> <li>Improvement of 1,000m of main village road</li> </ul>	<ul style="list-style-type: none"> <li>Improvement of 1,100m of main village road</li> </ul>

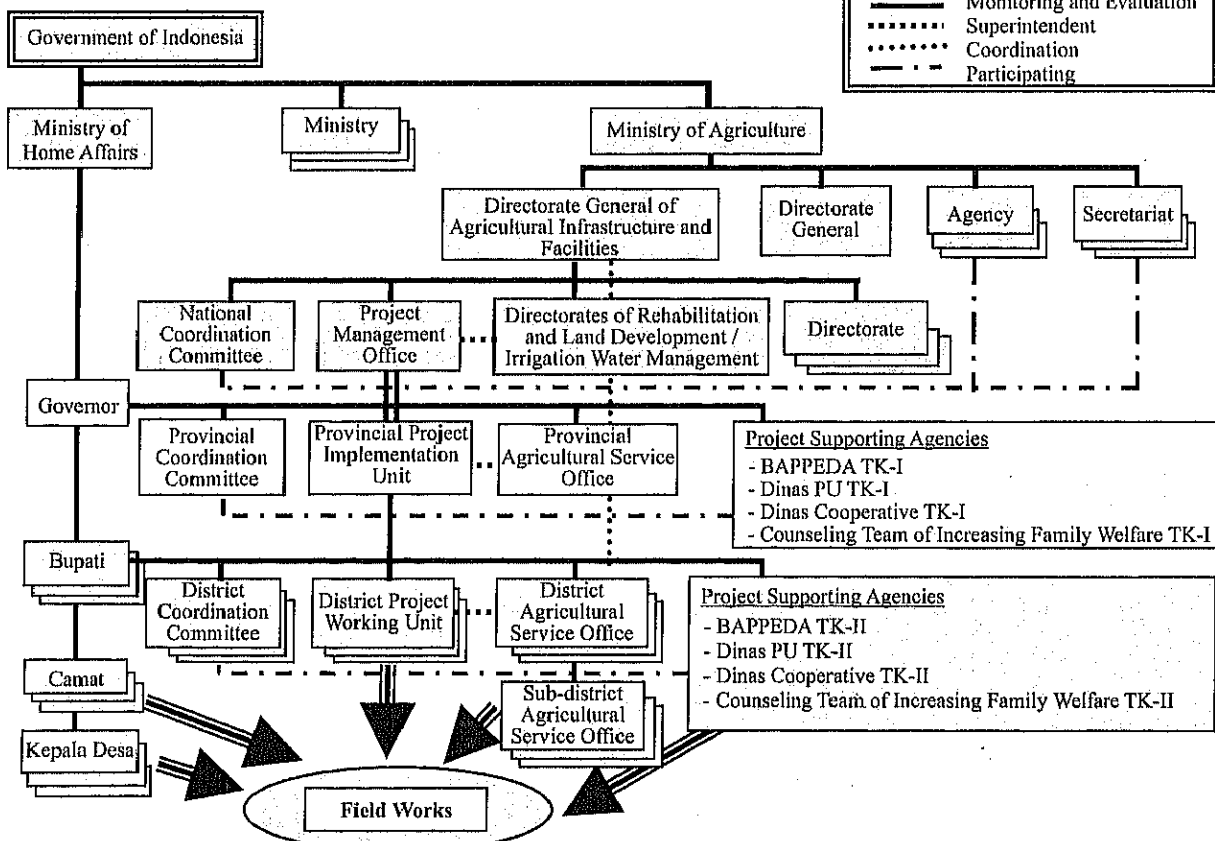
### 3.3 Agricultural and Rural Infrastructure Development ( Rural Water Supply Development Plan)

Item		Gekbrong	Langensari
Proposed Plan	Planning Parameters	1,700 persons (200 households) (Year 2010) 90 lit/person/day 5000~7000 Rp. /month/household is assumed. • Conveyance system will be conjunctively used with irrigation. • Filter tanks, storage tanks and distribution facilities are proposed independently from the irrigation facilities. • Priority on water use is given to drinking purpose by the structure design	2,000 persons (600 households) (Year 2010) 90 lit/person/day 7000~10000 Rp. /month/household is assumed. • Water will be pumped up by electric submersible pump from Cikole spring and distributed via pressure tank and pile lines.
	Proposed Plan	Conjunctive use with irrigation Conjunctive use with irrigation (PVC pipe line) 2-stage filter tank Capacity for one day demand PVC pile line Distribution stand (1 for 10 households on the average)	Electric submersible pump Pressure tank, PVC pipe line - - PVC pipe line Distribution stand (1 for 10 households on the average)

### 4. Education/training and Operation/management

Item	Mekarjaya	Tanjungkarya	Gekbrong	Langensari
Village facilitators (M/M)	324	167	108	162
External experts (M/M)	540			
Training for general farmers/farmers group	1 set	1 set	1 set	1 set
Training for agricultural field extension officer	1 set	1 set	1 set	1 set
Education/training for task teams	1 set	1 set	1 set	1 set
Operation & maintenance	1 set			
Equipment & machines	Vehicle: 2, Computer: 5, Copy machine: 1, Motor bike (for task teams): 25			

### Organization Structure





### Implementation Schedule

█ : Implementation Schedule for 4 Priority Model Areas

	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year
<b>Priority Model Areas</b>	← First Development →						
Preparation of Project Work	█						
Agricultural Infrastructure		█					
Formation of Farmers Association		█					
Training of Farmers Associations		█	█				
Monitoring and Evaluation	●	●	●	●	●	●	●
Preparation of F/S of 2 <sup>nd</sup> Stage		█					
<b>Remaining Model Areas</b>			← Second Development →				
Preparation of Project Work			█				
Agricultural Infrastructure			█				
Formation of Farmers Association			█				
Training of Farmers Associations			█	█			
Monitoring and Evaluation		●	●	●	●	●	●
Preparation of F/S of 3rd Stage				█			
<b>Other Highland Areas</b>				← Third Development →			
Preparation of Project Work				█			
Agricultural Infrastructure					█		
Formation of Farmers Association					█		
Training of Farmers Associations					█	█	
Monitoring and Evaluation					●	●	●
<b>Task Team and External Expert</b>							
- Task Team 1 <sup>st</sup> Stage Development	█	█	█				
2 <sup>nd</sup> Stage Development			█	█	█		
3 <sup>rd</sup> Stage Development					█	█	█
- External Expert	█	█	█	█	█		

### Project Costs

█ : Pre-construction Cost borne by Indonesian Government

Unit: million Rupiah

Item		Mekarjaya	Tanjungkarya	Gekbrong	Langensari	Total
Cost for Priority Model Area	Infrastructure	3,119	2,106	2,039	1,696	8,960
	Training & Extension	431	312	223	319	1,285
	Administration	622	445	400	352	1,819
	Land acquisition & Pre-construction Arrangement	88	104	57	53	302
	Price contingency	336	368	238	184	1,126
Common Cost for Highland	External experts	10,197				
	Adaptive Trial Farm (AFT)	404				
	Machine & Equipment	389				
	Training & Extension	246				
	Related cost	1,798				
	Total	13,034				
Total Project Cost		26,526				

### Operation and Maintenance Costs

█ : After-construction Cost borne by Indonesian Government

Unit: million Rupiah

Item	Mekarjaya	Tanjungkarya	Gekbrong	Langensa	AFT	Total
Maintenance & Operation (Annual)	115	72	82	159	20	448
Replacement Cost (Every 15 years)	925	54	639	384	51	2,053
Replacement Cost (Every 10 years)	154	53	81	28	171	487

## Project Evaluation

Results of Economic Evaluation	EIRR	Financial Evaluation	
Model Area	(%)	Typical Farm Holding Incremental Net Income per Annum (million Rupiah)	Cash Flow
1. Mekarjaya	23.3	2,400	<ul style="list-style-type: none"> <li>• Loan is repaid within 30 years with the anticipation of the living expenditure increase of 1.59 times (at the 10<sup>th</sup> year) from the present, assumed initial operation fund of the cooperatives is Rp. 1 million per ha</li> <li>• Beneficiaries burden for O&amp;M and replacement cost is Rp.1,920 x 10<sup>3</sup> per ha</li> </ul>
2. Tanjungkarya	16.2	3,520	
3. Gekbrong	17.2	5,340	
4. Langensari	17.2	1,800	
Total Area	19.1	—	
<b>Socio-economic Impact</b>		<b>Environmental Impacts</b>	
<ul style="list-style-type: none"> <li>• Increase of farmers' income</li> <li>• Increase in employment opportunities</li> <li>• Activation of rural organization</li> <li>• Market road serving for the rural areas</li> <li>• Expansion of women's role</li> <li>• Increase of farm inputs and equipment production</li> <li>• Expansion of non-farming business opportunity</li> </ul>		<ul style="list-style-type: none"> <li>• Facilitating efficient and sustainable use of land and agricultural activity</li> <li>• Improvement of living environment by applying suitable farming technology</li> <li>• Increase of farmers' motivation for farmland conservation practice by introducing conservation measure</li> <li>• Water resources preservation by improving irrigation system</li> <li>• Relaxing current population pressure on the upland agriculture by creating non-agricultural employment opportunity</li> <li>• Prevent further deterioration of land resources and environment by reducing agricultural population</li> </ul>	



- (1) The project is justified economically and financially with positive environmental impact.
- (2) The project will contribute greatly to improving income and living standards of the local people in the model areas as well as in the highland area.

## Recommendations

### (1) Early implementation of the Project

It is recommended to implement the project urgently.

### (2) Programs for project implementation

- 1) It is recommended to provide sufficient technical support to the district task teams from the national and provincial task teams.
- 2) Close collaboration with other offices such as Public Works Service Office, Cooperative Service Office, Counseling Team of Improvement of Family Welfare is needed. In addition, establishing National, Provincial and District Coordination Committees is recommended in order to provide technical guidance to task teams.
- 3) Prior to implementation of the Project, responsibility of the beneficiary in implementation and O&M should be clearly confirmed to encourage the farmers' initiative.
- 4) The Government should provide the assistance for the initial operation fund of the farmers' cooperative.
- 5) It is required to strengthen market information system so that farmers' cooperatives can access to market price information.
- 6) The Project benefits and environmental impacts should be monitored and evaluated continuously during project implementation as well as after completion of the Project.

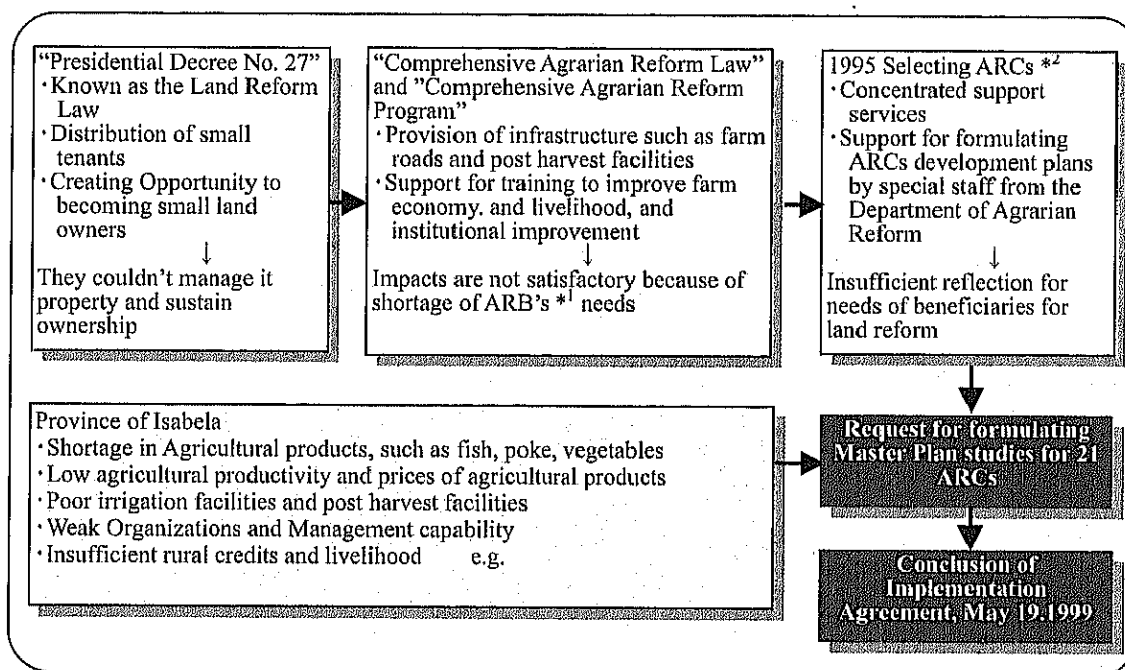
<b>The Study on The Development of Agrarian Reform Communities in the Province of Isabela</b>	Counterpart Agency	Department of Agrarian Reform (DAR)
	Consultant Companies	Sanyu Consultant Co., Ltd, IC Net Co., Ltd
	Team Leader	Masahiro Iida
	Study Period	1999.9 ~ 2001.1
	Study Type	Master Plan, Feasibility Study

**Background of the Study**

The Philippine Government has attempted to improve the unequal land ownership through the Presidential Decree No.27 in the Marcos regime and the Comprehensive Agrarian Reform Law in the Aquino regime.

Since 1995, the Department of Agrarian Reform has been implementing the Comprehensive Agrarian Reform in designated communities, in which the target people wanted the reforms and had certain qualifications. However, the reforms have not been well accomplished because the opinions of land reform beneficiaries have not been reflected in the reforms.

In this context, the Philippine Government requested the Japanese Government to formulate a master plan for the community based land reform. The Japanese Government agreed on the scope of the work for a study of the master plan on May 19, 1999, after a preliminary study and exchange of options between the two governments.



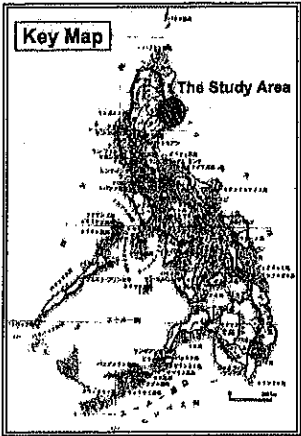
\*1 ARB: Agrarian Reform Beneficiary  
\*2 ARC: Agrarian Reform Community

**Objectives of the Study**

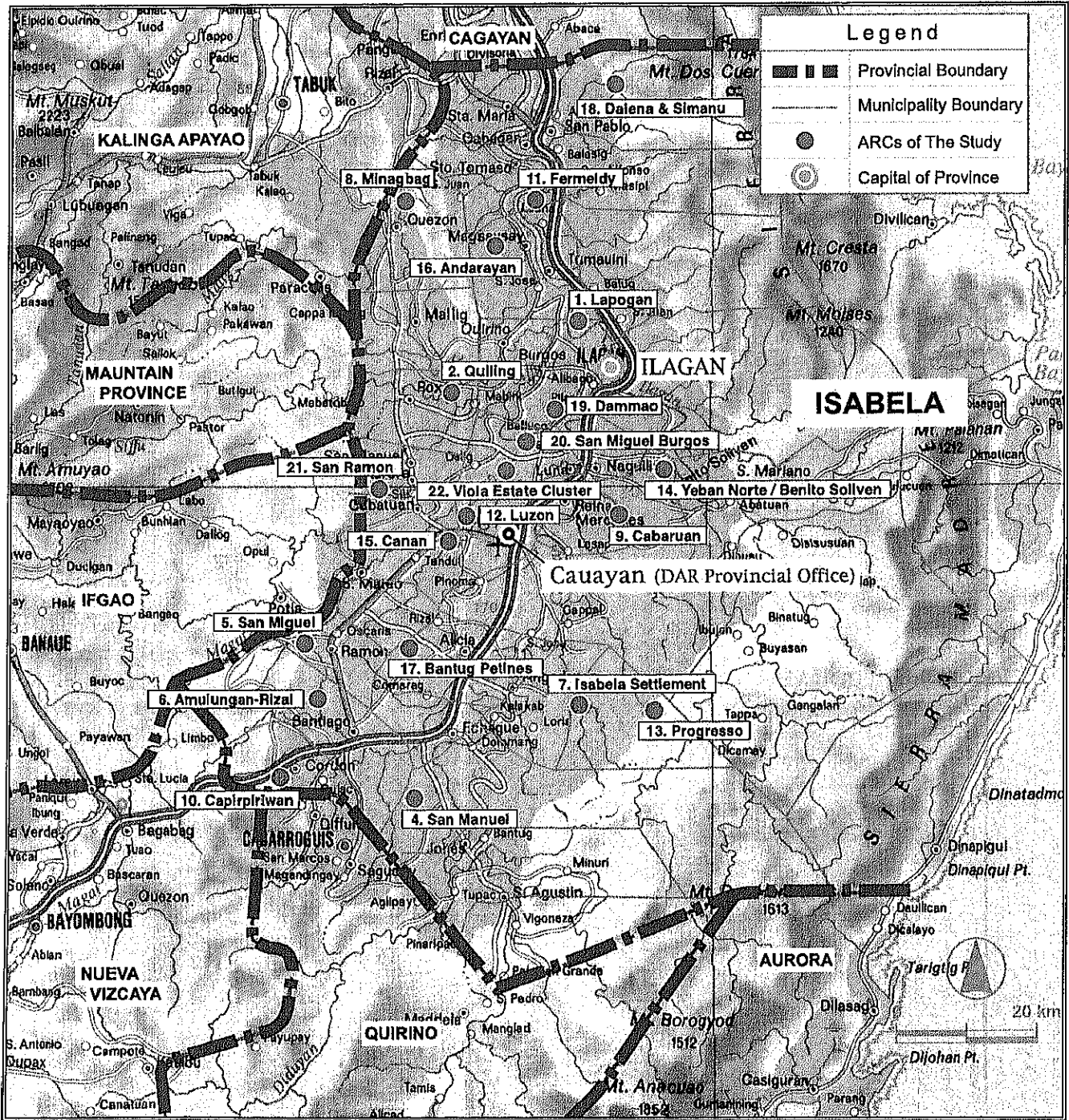
- (1) To formulate a Master Plan (M/P) for the development of 21 Agrarian Reform Communities in the Province of Isabela, to improve agricultural productivity and income
- (2) To conduct a Feasibility Study (F/S) on priority projects or areas/ Agrarian Reform Communities selected in the Master Plan; and,
- (3) To carry out technology transfer to the Philippine counterpart personnel through on-the-job training in the course of the study, concerning methods and planning

**Study Area**

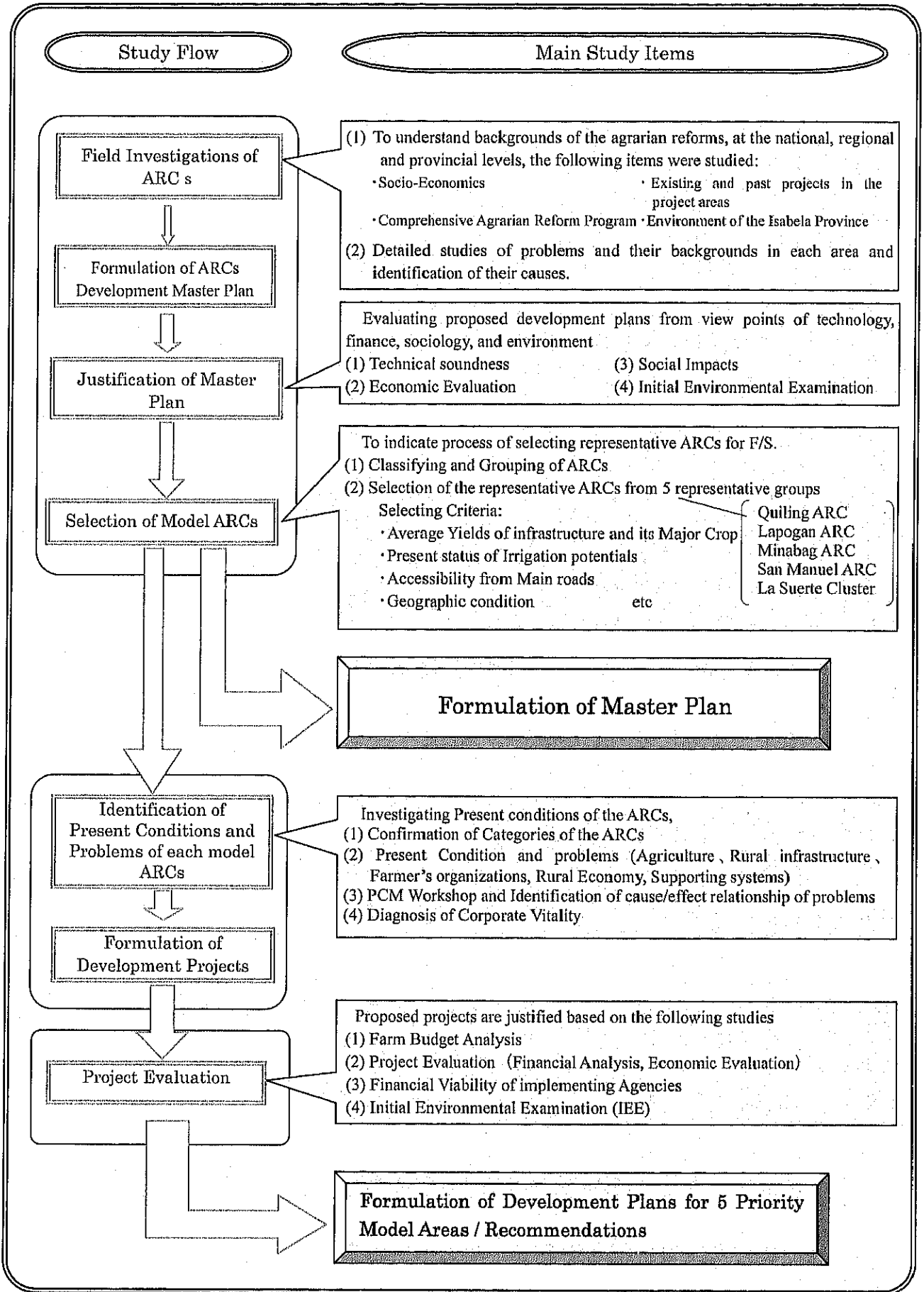
- (1) Twenty one (21) ARCs in the Province of Isabela in the master plan study
- (2) Five (5) ARCs selected in the M/P, as follows  
 Quiling ARC, Lapogon ARC, Minabag ARC, San Manuel ARC, La Suerte Cluster for the feasibility study



**Location Map**



**Study Items and Flow**



## Outline of the Master Plan

### Summary of the Plan

- |                           |  |
|---------------------------|--|
| (1) Target Groups         | ARBs in 21 ARCs in the Province of Isabela   |
| (2) Overall Goal          | Increase in ARB's income in the Province of Isabela  |
| (3) Objective             | Increase in ARB's income in 21 ARCs  |
| (4) Proposed Schemes      | ①Agricultural Development Scheme ②Farmer's Organization Strengthening Scheme, ③Development Support Scheme  |
| (5) Main Projects         | ①Agricultural Development ②Irrigation Development ③Post-Harvest Facility Development ④Farm to Market Road Development ⑤Farmer's Organization Strengthening ⑥Rural Credit ⑦Livelihood ⑧Management Capability Building   |
| (6) Expected Results      | 1) Improvement in agricultural productivity through introduction of irrigation, and of suitable farming technologies, etc.<br>2) Reduction of Production costs<br>3) Increase in farm gate Prices of quality products<br>4) Improvement in access to credit and decrease in interest rates<br>5) Stabilization in farm income<br>6) Improvement of support services. |
| (7) Implementation period | 20years  |

### Target Area & Plan

#### Target Area

21 ARCs

#### Agricultural Development Scheme

- (1) Agricultural Development Plan
  - 1) Expansion of irrigated paddy area and increase in cropping fields, (introduction of inter cropping of legume, improvement in variety and, plant protection)
  - 2) Change from corn to more profitable cash crops such as fruit trees, flowers, and forest trees, field training in production, sale and extension of seedlings
  - 3) Extension of technologies in contour farming and strip cropping of natural grasses by extension workers.
  - 4) Live stock development utilizing un-utilized natural grasses. (extension of animals, husbandry methods, animal protection and vaccination by provincial offices.)
  - 5) Technical information to extension workers from the national research center through regular meeting.
  - 6) Promotion of food processing for job opportunities and securing stable markets for raw products
- (2) Irrigation Development Plan  
Construction of reservoirs, pump stations, and building or rehabilitation of canals in areas, where farmers want the project to be implemented and the project has high feasibility.
- (3) Post-Harvest Facility Development Plan  
Phased introduction of solar dryers, grain ware houses and mechanical dryers for wet season crops.
- (4) Farm Road Development Plan  
Improvement of existing roads by graveling, and newly construction of roads

#### Farmer's Organization Strengthening Scheme

- (1) Strengthening of rules  
Establishment of supporting teams, covering wide areas, Improvement in personnel management for advanced agricultural organizations
- (2) Strengthening of organizations  
Training of progressive cooperatives, Development Facilitators, and NGOs which will become initiators in the preliminary stages.
- (3) Pilot Project
  - 1) Implementation of the pilot project to establish the foundation of development processes in the entire area, and to formulate rules and organization aspects.
  - 2) Assignment of technical specialists from international agencies for early settlement of technical problems.

\*1 ARB: Agricultural Reform Beneficiary

\*2 ARC: Agricultural Reform Community

Development Support Scheme
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## (1) Rural Credit Plan

- 1) Micro finance accessible for those who have none or limited collateral.
- 2) Establishment of the joint loan appraisal committee to evaluate loan proposals and to monitor spending.
- 3) Establishment of a landownership model project

## (2) Livelihood Plan

To implement livestock development, the back yard garden development, the Tilapia aquaculture development and the mushroom culture development, for income generating and nutrition improvement of farmer's family.

## (3) Management Capability Building Plan

Training programs for staff of the agencies, NGO staffs, and farmer beneficiaries who will play an important role in project operation and maintenance. Training program will consists of a lecture on development planning, planning workshop, a lecture on monitoring and evaluation, training for trainers, and a lecture on project management.

Projects
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Target Areas: 5 Priority Model Areas
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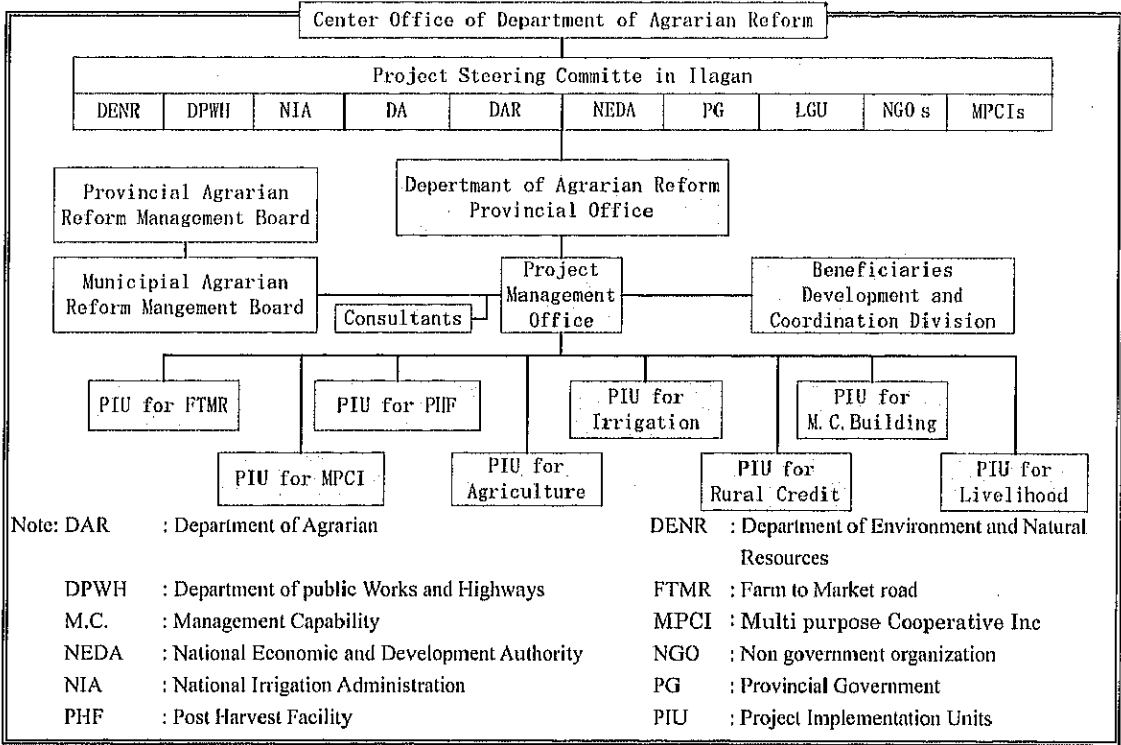
No	Name of Area	Characteristics	Area (ha)	Population (person)
1	Quiling ARC	Prime Agriculture Area, Flat, Irrigation Existing facilities provided.	240	1,079
2	Lapogan ARC	Developing area, Flat, High potentiality of Irrigation development, no existing irrigation facilities	993	2,251
3	Minabag ARC	Developing area, Rolling lands, High potentiality of Irrigation development, Insufficient irrigation facilities	3,952	2,259
4	San Manuel ARC	Developing area, Rolling hills, Low potentiality of Irrigation development	1,519	1,164
5	La Suerte Cluster	Remote area, Hilly land, Low potentiality of irrigation development	1,935	3,864

Area	Quiling ARC	Lapogan ARC	Minabag ARC	San Manuel ARC	La Suerte Cluster
<b>(1) Agricultural Development Scheme</b>					
Agricultural Development Plan	<b>Rice Production</b> <ul style="list-style-type: none"> <li>Control of Tungro Virus disease</li> <li>Introduction of Hybrid Rice</li> <li>Introduction of inter-cropping</li> </ul> <b>Corn Production</b> <ul style="list-style-type: none"> <li>Converting 20% of corn area to vegetable area</li> <li>Technical support for Integrated Pest Management/control and Integrated Nutrition Management</li> </ul>	<b>Rice Production</b> <ul style="list-style-type: none"> <li>Introduction of Hybrid Rice</li> </ul> <b>Corn Production</b> <ul style="list-style-type: none"> <li>Cornfields conversion of 325ha to paddy fields</li> <li>Technical support for Integrated Pest Management/control and Integrated Nutrition Management</li> <li>Conversion into fruit gardens</li> </ul>	<b>Rice Production</b> <ul style="list-style-type: none"> <li>Development of 45ha paddy fields</li> <li>Control of Tungro Virus disease</li> <li>Introduction of Hybrid Rice</li> <li>Introduction of inter-cropping</li> </ul> <b>Corn Production</b> <ul style="list-style-type: none"> <li>Conversion to fruit gardens (88ha)</li> <li>Community nursery operation</li> <li>Technical support for Integrated Pest Management and Integrated Nutrition Management</li> </ul>	<b>Corn Production</b> <ul style="list-style-type: none"> <li>Technical support of Integrated Pest Management/control and Integrated Nutrition Management</li> <li>Converting of 100ha cornfield to fruit gardens (banana, pineapple)</li> <li>Community nursery operation</li> <li>Technical services on slope farming</li> </ul>	<b>Corn Production</b> <ul style="list-style-type: none"> <li>Technical support for Integrated Pest Management/control and Integrated Nutrition Management</li> <li>Conversion of 182ha cornfield to fruit garden (banana)</li> <li>Community nursery operation</li> <li>Technical services on slope farming</li> <li>Technical services for the promotion of animal industry</li> </ul>
Irrigation Development Plan	—	<ul style="list-style-type: none"> <li>Organizing Irrigation Associations assisted by National Irrigation Agency</li> <li>Water Intake of 669.5lit /sec from Cagayan river, canal pavement to 8.47km</li> </ul>	<ul style="list-style-type: none"> <li>Organizing Irrigation Association assisted by National Irrigation Agency</li> <li>Water Intake of 92.7lit /sec from Padapad creek, canal pavement to 1.66km</li> </ul>	—	—
Post-Harvest Facility Development Plan	<ul style="list-style-type: none"> <li>A Solar Drying yard of 11,472m<sup>2</sup></li> <li>Ware-house 140m<sup>2</sup> floor area with solar drying yard of 2,647 m<sup>2</sup> and a mechanical dryer with a capacity of 30 Cavan/Day</li> </ul>	<ul style="list-style-type: none"> <li>A Solar Drying yard of 27,477m<sup>2</sup></li> <li>Ware-house 305m<sup>2</sup> floor area with solar drying yard of 6,341 m<sup>2</sup> and a mechanical dryer with a capacity of 80 Cavan/Day</li> </ul>	<ul style="list-style-type: none"> <li>A Solar Drying yard of 24,311m<sup>2</sup></li> <li>Ware-house 300m<sup>2</sup> floor area with solar drying yard of 5,610 m<sup>2</sup> and a mechanical dryer with a capacity of 30 Cavan/Day</li> </ul>	<ul style="list-style-type: none"> <li>A Solar Drying yard of 43,381m<sup>2</sup></li> <li>Ware-house 240m<sup>2</sup> floor area with solar drying yard of 10,001 m<sup>2</sup> and a mechanical dryer with a capacity of 120 Cavan/Day</li> </ul>	<ul style="list-style-type: none"> <li>A Solar Drying yard of 25,286m<sup>2</sup></li> <li>Ware-house 100m<sup>2</sup> floor area with solar drying yard of 5,835 m<sup>2</sup> and a mechanical dryer with a capacity of 30 Cavan/Day</li> </ul>
Farm Road Development Plan	<ul style="list-style-type: none"> <li>Width of 3.5m with gravel covered road surface</li> <li>Length of 3.44km</li> </ul>	<ul style="list-style-type: none"> <li>Width of 3.5m with gravel covered road surface</li> <li>Length of 8.55km</li> </ul>	<ul style="list-style-type: none"> <li>Width of 3.5m with gravel covered road surface</li> <li>Length of 8.17km</li> </ul>	<ul style="list-style-type: none"> <li>Width of 3.5m with gravel covered road surface</li> <li>Length of 8.80km</li> </ul>	<ul style="list-style-type: none"> <li>Width of 3.5m with gravel covered road surface</li> <li>Length of 8.37km</li> </ul>
<b>(2) Farmer's Organization Strengthening Scheme</b>					
	<ul style="list-style-type: none"> <li>Establishment of rules and regulations</li> <li>Study items of other good cooperatives</li> <li>Introduce new projects such as Rice Marketing</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of rules and regulations</li> <li>Introduction of new projects such as rice marketing</li> <li>Training of staff members of the Board of Directors</li> </ul>	<ul style="list-style-type: none"> <li>Repayment of the loan for Minabag MPCI<sup>3</sup> by joining the Epiphany MPCI</li> <li>Introduction of new projects such as rice marketing</li> <li>Establishment of training centers</li> <li>Training of staff members of the Board of Directors</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of rules and regulations</li> <li>Introduction of new projects such as rice marketing</li> <li>Training of staff members of the Board of Directors.</li> </ul>	<ul style="list-style-type: none"> <li>Guidance for prospective members</li> <li>Introduction of new projects such as rice marketing</li> </ul>
<b>(3) Development Support Scheme</b>					
Rural Credit Plan	<ul style="list-style-type: none"> <li>Micro-finance for the poor</li> <li>Micro-finance for female organizations</li> <li>Training of loanee farmers, the payers</li> </ul>	<ul style="list-style-type: none"> <li>Quick repayment to cooperatives</li> <li>Micro-finance for the disadvantaged by the project</li> <li>Micro-finance for females</li> </ul>	<ul style="list-style-type: none"> <li>Quick repayment to cooperatives</li> <li>Micro-finance for poor members</li> <li>Micro-finance for female</li> <li>Institutional development of the Epiphany MPCI</li> </ul>	<ul style="list-style-type: none"> <li>Quick repayment to cooperatives</li> <li>Micro-finance for the disadvantaged by the project</li> </ul>	<ul style="list-style-type: none"> <li>Preparation of guidelines for resumption of loans</li> <li>Resumption of loans</li> <li>Micro-finance for the disadvantaged by the project</li> </ul>
Livelihood Plan	<ul style="list-style-type: none"> <li>Technical services and supply of fingerlings for Livestock development, the back yard gardening development, aquaculture development, the mushroom culture development and the simple agro-processing.</li> </ul>				
Management Capability Building Plan	<ul style="list-style-type: none"> <li>Training of government officials of line agencies, of the Department of Agrarian Reform Province Office, NGO, Local Government Units staff and, Barangays</li> <li>①a lecture on formulating development plans ②Planning Workshop ③a lecture on monitoring and evaluation ④Training of trainers and ⑤a lecture on project management</li> </ul>				
<b>(4) Operation and Management plan</b>					
Organization in charge	<ul style="list-style-type: none"> <li>Irrigation facilities(Quiling): Irrigator Association and Magat River Integrated Irrigation System</li> <li>Irrigation facilities(others): Irrigator Association</li> <li>Solar Dryer : Barangay authorities</li> <li>Ware House by Cooperative: Multi Purpose Cooperative Inc.</li> <li>Production Road: Barangay authorities</li> </ul>			<ul style="list-style-type: none"> <li>Solar Dryer: Barangay</li> <li>Ware House by Cooperative: Multi Purpose Cooperative Inc.</li> <li>Farm To Market Road: Local Government Unit and Barangay authorities</li> <li>Production Road :Barangay authorities</li> </ul>	

\*3 MPCI : Multi Purpose Cooperative Inc.



### Organization Structure



### Implementation Schedule

Item	Short term(1~5years)					Middle Term(6~10years)					Long Term(11~20years)									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agricultural Development	—————					—————														
Irrigation Development	—————										—————									
Post Harvest Facility Development	—————					—————					—————									
Farm Road Development	—————					—————					—————									
Farmer's Organization Development	—————					—————					—————									
Rural Credit Development	—————																			
Livelihood Development	—————																			
Management Capability building	—————																			

**Legend**

Quilling ARC      —————

Lapogan ARC      —————

Minabag ARC      —————

San Maznuel ARC      —————

La Suerte Cluster      —————

Unit: thousand peso 1Peso=2.5238Yen

Project Costs	Item	Unit: thousand peso 1Peso=2.5238Yen					Total
		Quiling	Lapogan	Minabag	San Manuel	La Suerte Cluster	
	Agricultural Development	24	31	165	155	166	541
	Irrigation	0	55,246	8,906	0	0	64,152
	Post-Harvest Facility	5,915	19,285	85,946	22,429	21,352	104,927
	Farm Roads	970	2,538	3,707	2,338	17,950	27,503
	Farmer's Organizations	921	921	921	921	921	4,606
	Rural Credit	4,488	4,488	4,488	4,488	4,488	22,440
	Livelihood	199	199	203	203	102	906
	Management Capability Building	608	608	608	608	608	3,040
	Operation and Management	9,595	9,595	88,975	70,071	70,071	248,807
	Consultants	37,827	40,589	38,272	37,827	37,827	192,342
	Sub-Total	60,547	133,500	182,191	139,040	153,485	668,763
	Administration Costs (8%)	4,846	10,679	14,576	11,122	12,279	53,502
	Physical Contingencies (10%)	6,540	14,421	19,679	15,017	16,576	72,233
	Price Escalation	19,872	37,514	81,059	55,554	59,230	253,229
	Total	91,805	196,114	297,505	220,733	241,570	1,047,727

Unit: thousand peso 1Peso=2.5238Yen

Operation and Maintenance Costs	Term	Unit: thousand peso 1Peso=2.5238Yen					Total
		Quiling	Lapogan	Minabag	San Manuel	La Suerte Cluster	
	Short (5Years)	22	371	248	64	67	772
	Middle (10Years)	369	1,300	1,276	460	574	3,969
	Long (20years)	778	2,725	2,874	1,030	1,337	8,744
	Sub-Total	1,169	4,396	4,398	1,544	1,978	13,485
	Physical Contingencies (10%)	113	440	442	156	198	1,349
	Total	1,282	4,836	4,840	1,700	2,176	14,834

### Project Evacuation

Study Area	Economic Analysis EIRR(%)	Financial Analysis FIRR(%)	Farm Budget Analysis	
			(1) Quiling	22~37
(2) Lapogan	18~30	23~36	Financials Viability of Implementing Agencies	
(3) Minabag	15~31	24~	<ul style="list-style-type: none"> <li>The financial viability of the municipality in terms of its Net Loanable allowance is much higher than proposed costs in every year.</li> </ul>	
(4) San Manuel	19~27	~15		
(5) La Suerte Cluster	43~69	49~		
Initial Environmental Examination				
<ul style="list-style-type: none"> <li>The development plans will not have serious impact on the present environment condition, because the development plans proposed are small in scale. Environmental Impact Assessment is not necessary</li> <li>On socio-economic environment, some items have negative impact. But they will reduce when the project will be implemented.</li> </ul>				

It is worth conducting this project from technical and financial aspects

\*4 NPV: Net Production Value

### Recommendations

- Setting up Steering Committee and its mandates  
To implement projects smoothly, it is recommended to set up steering committees, which will accommodate concerning bodies such as government agencies, local government units, and NGOs. It is necessary for the steering committee that role, responsibility, and items of support, related organization, are made clear, without duplication and omissions.
- It should be implemented quickly.  
It is difficult to implement these projects quickly under present financial condition in the Philippines. It is recommended to start implementing projects quickly, with technical or financial support from financial bodies or Official Development Aid programmes in the world.
- About technical transfer  
Government organization, related to this project should provide farming technologies required in each area under the responsibility of the steering committee.
- Responsibility of administration  
Implementation programs of CARP <sup>\*5</sup>, beneficiaries opinions and the DARPO <sup>\*6</sup> underneath the steering committee will mainly conduct projects. Staff of DAR <sup>\*7</sup> should conduct these programs with responsibility under the objectives of this project.

\*5 CARP: Comprehensive Agrarian Reform Program \*6 DARPO: Department of Agrarian Reform Provincial Office \*7DAR: Department of Agrarian Reform

<b>The Study on Small Scale Agricultural and Rural Development Program Along The Mekong River</b>	Counterpart Agency	Ministry of Agriculture and Forestry
	Consultant Companies	Sanyu Consultants Co., Ltd / Nippon Koei Co., Ltd
	Team Leader	Yoshitomo MIYANISHI
	Study Period	1998.10 ~ 2000.3
	Study Type	Master Plan, Feasibility Study

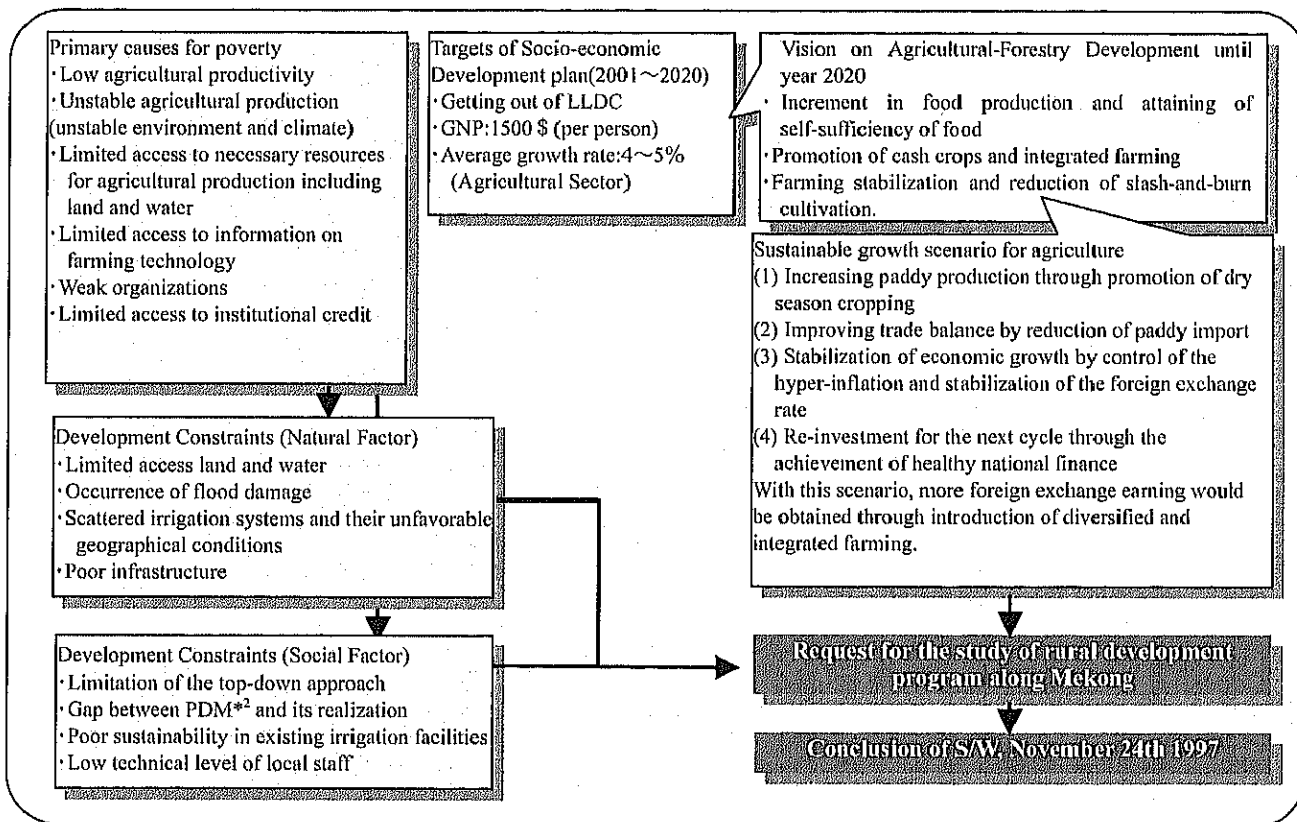
**Backgrounds of the Study**

The Republic of Laos prepared the Socio-economic development plan for 2000~2020 aiming to get out of LLDC\*1. In the plan the agricultural growth rate was set at 4 to 5 percent per year.

The "Vision on Agricultural-Forestry Development until year 2020", which was made based on the above plan, advocated the following objectives for, i.e. agricultural development: (1) increment in food production and attaining of self-sufficiency of food; (2) promotion of cash crops and integrated farming with animal husbandry; and (3) farming stabilization and reduction of slash-and-burn cultivation.

On the other hand, the poor cover 40 % of the total population in the study area, along Mekong River. The situation may become worse, because of flood damage, and problems in irrigation facilities, water management and purchasing agricultural chemicals and fertilizers

In this context, the Laos Government requested the Japanese Government for technical assistance. In response, the Japanese Government sent a preliminary study mission and exchanged opinions with the Laos government. Both Governments agreed in the Scope of Works for the study on November 24, 1999.



\*1 LLDC : Least Less Development Country  
 \*2 PDM :Project Design Matrix

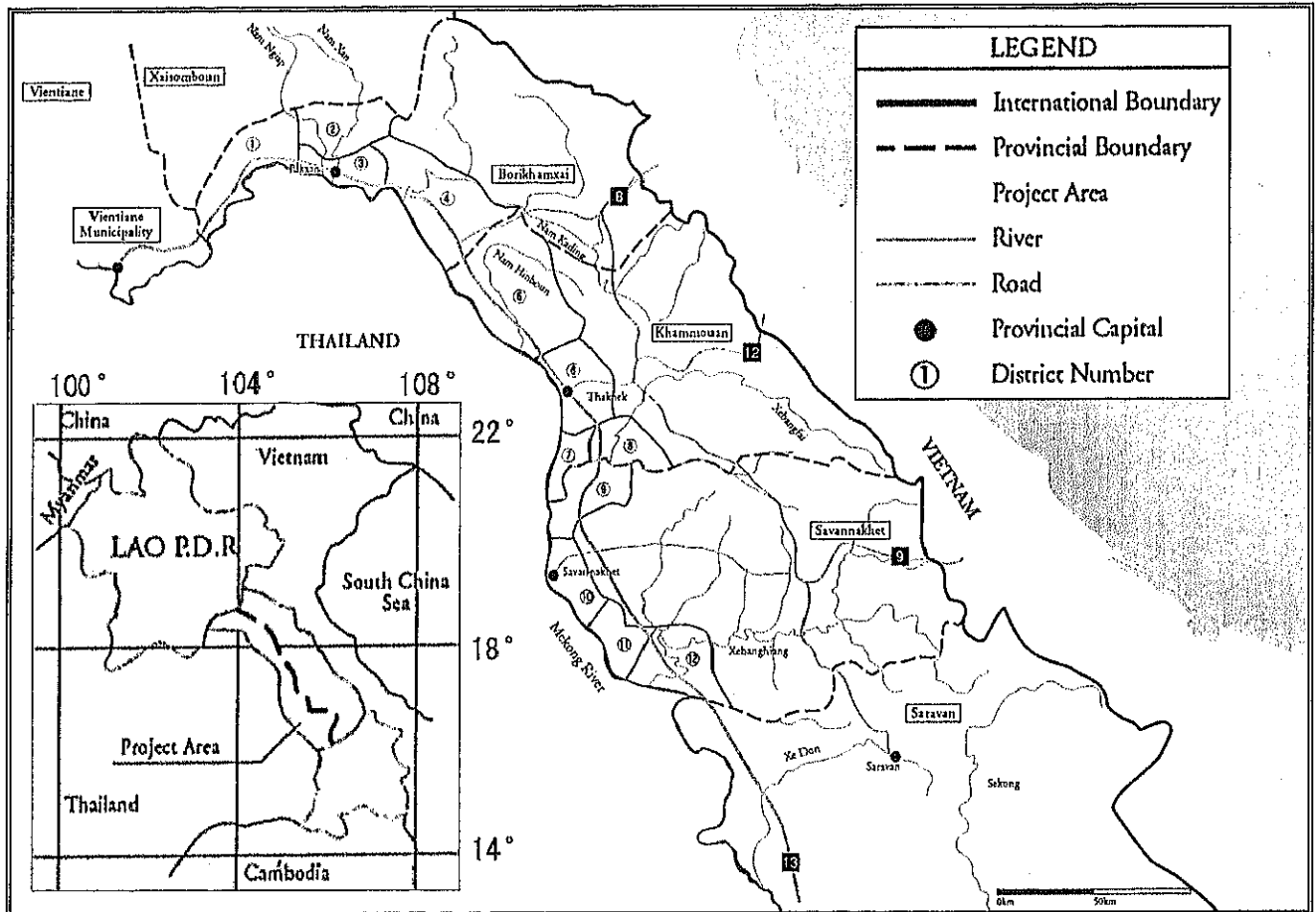
**Objectives of the Study**

- (1) To formulate Master Plan with the purpose of stable farming by organization of farmers, introduction of dry-season paddy under irrigation to be fundable by any agricultural credit, and improvement of traditional farming, and to conduct feasibility studies on selected priority projects.
- (2) To carry out technology transfer to counterpart personnel through on-the-job training.

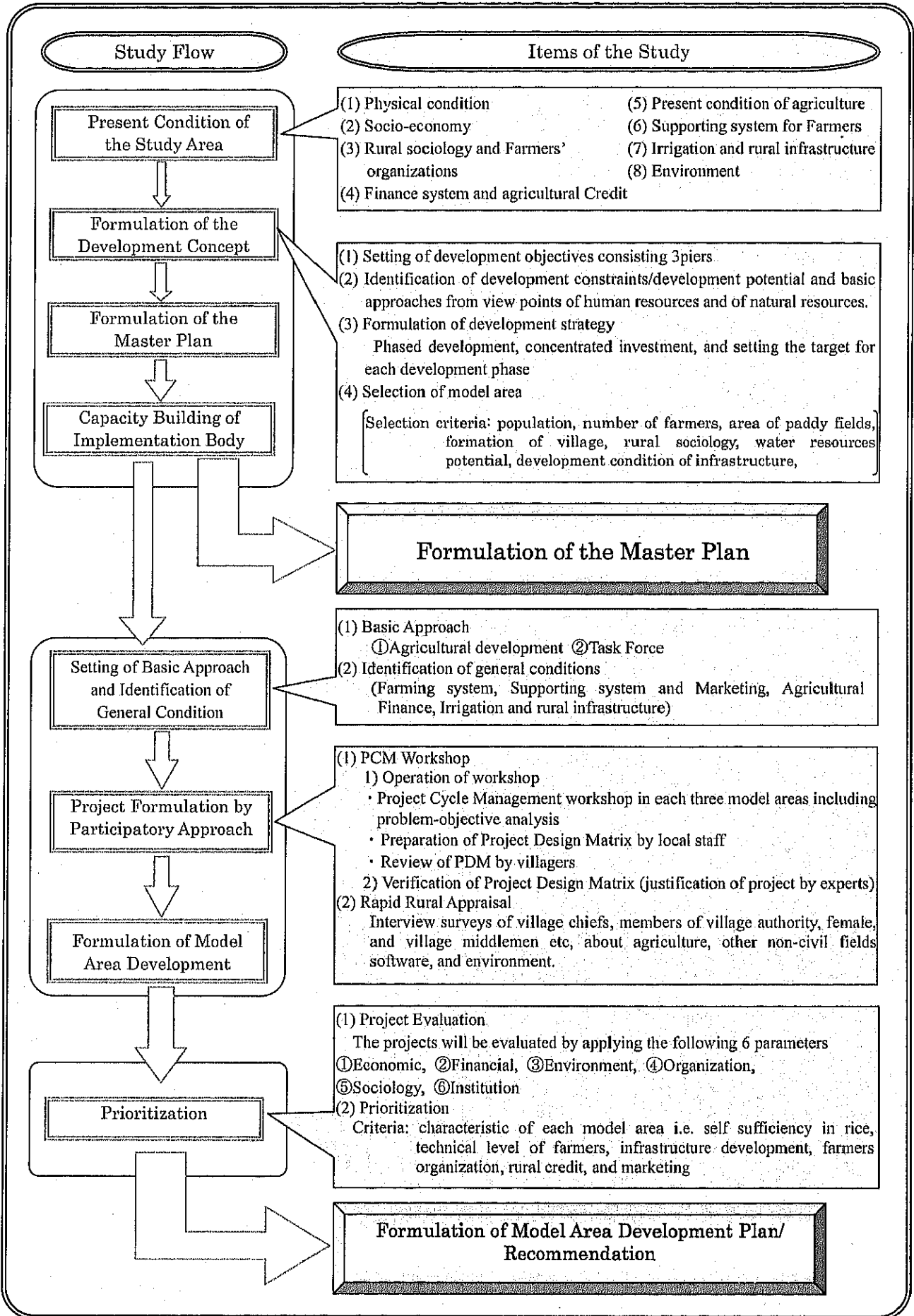
**Study Area**

- (1) M/P: 1021 villages(ban) along the Mekong River under 114 zones(khet) of 12 districts(muong) in the 3 provinces of Bolikhamxai Khammouane and Savanakheth (M/P)
- (2) F/S: Thongharb-Nakhua Area in Pakkading district of Bolikhamxai province, Vangkhang Area in Hinboun district Khammouane province, Phonthan Area in Xayphouthong district of Province of Savanakheth

**Location Map**



**Study Items and the study Flow**



## Outline of the Plan

### Summary of the Plan

- |                            |   |
|----------------------------|---|
| (1) Target Group           | Farmers in the study area   |
| (2) Overall Goal           | Improvement in the rural environment and upgrading of the living standard of villagers  |
| (3) Objectives of the plan | Improvement in the livelihood of farmers and of the rural environment through increasing agricultural productivity  |
| (4) Proposed Plans         | ①Improvement in the agricultural financing, ②Strengthening of Farmers' Organization, ③Stabilization of farming  |
| (5) Main Projects          | Improvement in financial system, Improvement in the agricultural finance, Strengthening Farmers' Groups/Organizations, Strengthening of supporting system, Improvement in small irrigation systems          |
| (6) Expected Results       | 1) Establishment of the farmers' organization<br>2) Development of the financing system and financing for farmers.<br>3) Extension of improved farming technologies and development of rural infrastructure |
| (7) Target Year            | 5Years  |

### Target Area & Plan

#### Study Area

1021 villages(ban) along the Mekong River under 114 zones(khet) of 12 districts(muong) in the 3 provinces of Bolikhamtai Khammouane and Savanakheth (M/P)

### Agricultural Financing Improvement Plan

- (1) Improvement in the financing system
  - 1) Improvement in the bank accounting system as an urgent matter, through sending foreign experts and domestic experts
  - 2) Establishment of the short-term financial market
  - 3) Early liberalization in interest rates and opening of new branches/field offices
  - 4) Renovation of the Bank of Lao training center in anticipation of a high priority of training of bank staff.
- (2) Strengthening of the Agricultural Promotion Bank
  - 1) Improvement in the accounting system including management system of fixed assets and stocks, following Bank of Lao guidance
  - 2) Re-structuring such as by increase in the capitals, re-division of the accounting division, strengthening of the auditing section and auditing by external organizations,
  - 3) Capacity building of the staff by training of financing system in the Bank for Agricultural and Agricultural Cooperative of Thailand.
  - 4) Strengthening of the Management of Information System and reinforcing communication network among head office, branch office and S.U. to cope with increasing demand for dry season production loan.

### Farmers Organization Strengthening Plan

- (1) Development of legal framework for farmers' groups (Water Users Agencies and Agricultural Production Groups)
- (2) Strengthening of the educational and training system for farmers (group leaders) and supporters (District Agricultural and Forestry Service Office staff)
- (3) Deployment of community development organizers at Province Agricultural and Forestry Service Office level  
Primary objectives of the above are ①to enhance efficiency of receiving the necessary support services, ②to equally distribute the limited local resources ③to strengthen the Bargaining power in price negotiation for agricultural input as well as agricultural product through joint purchase and sale activities.

**Stabilization of Farming and  
Increase in Agricultural  
Production**

- (1) Integration of sector-wise extension systems into the consolidated system just like in National Agricultural and Forestry Research Institute.
- (2) Establishment of staff database such as on training careers of the staff with a purpose of effective utilization of human resources for establishment of Task Force.
- (3) Technical guidance and training of Subject Master Specialist and of Task Force Team members in order to maintain irrigation systems and to support Water Users Groups.
- (4) Establishment of the Inventory of irrigation schemes

**Capacity Building of  
Implementing Bodies**

- (1) Capacity Building of Farmer-Beneficiaries  
Issues and Solutions are below.  
 Issues : Low or insufficient technical level of farmers  
           : Poor information system  
           : Insufficient staff in public agencies for the extension  
 Solutions : Training and education for farmers,  
               : Organizing farmers and promoting coordination among organizations  
               : Establishment of contract farmers
- (2) Capacity Building of Supporting Bodies  
Issues and Solutions are below.  
 Issues : Insufficient or poor technical level of the extension staff  
           : No sustainability of foreign assisted projects  
           : Lack of consistency in the public administration system  
           : Improper allocation of staff  
 Solutions : Training and education of extension staff  
               : Integration of cross-wise supporting systems  
               : Provision/reinforcement of office facilities and equipment in District  
                   Agricultural and Forestry Service Offices and Agricultural Promotion  
                   Banks
- (3) Establishment of Task Force Team  
The scope of Task Force Team activities is as follows.  
 Objective : Adoption of the intensive and participatory development approach  
 Roles : As an interface between farmers or farmers' organizations and the  
           support system provided by public agencies  
           : Information collection points of public agencies,  
           : Facilitators of various activities undertaken by farmers or farmers'  
               organizations  
 Staffs : District Agricultural and Forestry Service Office /Agricultural  
           Promotion Bank staff  
 Activities : Every staff will take part in extension activities for farmers covering  
               every discipline.

<b>Project Plan</b>
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Target Area: 3 Priority Model Area
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Group	Name of Area	Development Approach	Area (ha)	Farmland (ha)	Population (person)	Number of Household	Average income (KIP/households)	Remarks
1	Thongharb-Nakhua	• Basin-wide Water management Model with Improvement in agricultural Finance and Farmers organization	12,000	727.8	2,522	452	9,150,000	Moderate poverty, Low trust in public administration and credit service due to failure in irrigation projects
2	Vangkhoeng	• Integrated Irrigation Development Agricultural Model with Poverty alleviation through Stabilization of Paddy Cropping and Its Self-sufficiency	4,552	52.0	246	47	6,250,000	Poorest areas, flood plain, high demands for self-sufficiency and irrigation projects
3	Phonthan	• Small River Basin Conservation Model with promotion of Advanced Farming	2,157	575.0	2,453	412	9,280,000	Advanced agricultural area, capable of self sufficiency in rice, highest positive attitude

Three Piers for Development		A. Improvement of Financial System		B. Farmers Organization	C. Stabilization of Farming/Production Increase		
Project Component		Improvement in Financial System	Improvement in Agricultural Finance	Strengthening in Farmers Group/Organization	Strengthening in Supporting System	Improvement in Irrigation	
1. Master Plan		<ul style="list-style-type: none"> <li>Improvement in Bank Accounting System</li> <li>Establishment of Financial Market</li> <li>Liberalization in Interest Rates and establishment of Business Branch</li> <li>Renovation of the BOL Training Center</li> </ul>	<ul style="list-style-type: none"> <li>Improvement in Accounting System</li> <li>Restructuring</li> <li>Staff Training</li> <li>Strengthening of MIS</li> </ul>	<ul style="list-style-type: none"> <li>Preparation of Legal framework for farmers' groups</li> <li>Training of farmers &amp; support staff</li> <li>Establish and allocation of CDO</li> </ul>	<ul style="list-style-type: none"> <li>Integration of system-wise extension systems</li> <li>Preparation of staff database</li> <li>Strengthening of MIS</li> </ul>	<ul style="list-style-type: none"> <li>Preparation of inventory of irrigation schemes</li> </ul>	
2. Model Area Development (1/2/02)	Development Direction						
	Thongharb-Nakhua	Improvement in public and financing services as well as improvement in water management	—	<ul style="list-style-type: none"> <li>Preparation of the credit system for improvement/rehabilitation of irrigation facilities</li> <li>New staff recruitment for Paksan SU</li> </ul>	<ul style="list-style-type: none"> <li>Strengthening of WUG &amp; upgrading to WUA</li> <li>Establishment of APG</li> </ul>	<ul style="list-style-type: none"> <li>Introduction of participatory approach for irrigation experts and TFT members</li> <li>Capacity building through OJT</li> </ul>	<ul style="list-style-type: none"> <li>Prompt rehabilitation of destroyed irrigation facilities</li> <li>Construction of a weir in Thongharb</li> </ul>
	Vangkhoeng	Development of dry season paddy through irrigation expansion. Development of service systems	—	<ul style="list-style-type: none"> <li>Preparation of the credit system for improvement/rehabilitation of irrigation facilities</li> <li>New staff recruitment for Hinboun SSU</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of WUG</li> <li>Establishment of APG</li> </ul>	<ul style="list-style-type: none"> <li>Capacity building of DAFSO staff for irrigated agriculture</li> <li>Capacity building through OJT</li> </ul>	<ul style="list-style-type: none"> <li>Verification of planned irrigation projects and their early implementation</li> <li>Transfer of existing pump station, canal construction and reclamation</li> </ul>
	Phonthan	Promotion of farmers' organization (WUA/WUG), for effective farm production and marketing	—	<ul style="list-style-type: none"> <li>Preparation of the credit system for crop diversification and integrated farming</li> <li>New staff recruitment for Savanaket Branch</li> </ul>	<ul style="list-style-type: none"> <li>Development of farmers' organization such as WUG/ APG / BSG</li> <li>Arrangement of system to receive public support and financial services</li> </ul>	<ul style="list-style-type: none"> <li>Capacity building of TFT members in marketing of farm inputs and products</li> <li>Capacity building through OJT</li> </ul>	<ul style="list-style-type: none"> <li>Development of new water resources and proper dam operation for irrigation development for the sake of advanced integrated farming</li> <li>Heightening dyke and canal extension</li> </ul>

APB : Agricultural Promotion Bank  
 BSG : Buying Selling Group  
 MIS: Management of Information System  
 TFT : Task Force Team

APG: Agricultural Production Group  
 CDO: Community Development Officer  
 SU: Service Unit  
 WUG : Water Users Group

BOL: Bank of Lao  
 FSC: Food supply Company  
 SSU: Sub Service Unit



<b>Schedule</b>
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Item	1st	2nd	3rd	4th	5th
<b>1. Master Plan</b>					
<b>1.A Agricultural Finance</b>					
<b>1.A.1 Improvement in Financial System</b>					
- Improvement in Accounting System					
- Establishment in Short-term Financial Market on					
- Liberalization in Interest Establishment of Rate& Branch offices					
- Renovation of BOL's Training Center					
<b>1.A.2 Strengthening of the Agricultural Promotion Bank</b>					
- Improvement in Accounting System					
- Restructuring of the Head Office					
- Staff training					
- Establishment of Management Information System					
<b>1.B Farmers' Organizations</b>					
- Development of Legal Framework					
- Education & Training of Farmers and supporters					
- Development of Community Organazer					
<b>1.C Stabilization and Increase of Agricultural Production</b>					
- Integrated section-wise of Extension Systems					
- Establishment of Staff Database					
- Technical Guidance/Training of SMS & Task Force Team					
- Preparation of Inventory of Irrigation Schemes					
<b>2. Model Area Development (F/S)</b>					
<b>2.A Agricultural Finance</b>					
- Strengthening of APB Field offices					
Pakusan Service Unit (Thongharb-Nakhua Area)					
Hinboun Sub-Service Unit( Vangkhong Area)					
Savanakhet Branch (Phonthan Area)					
<b>2.B Farmers' Organizations</b>					
- Establishment/Strengthening of Groups/Organizations					
Thongharb-Nakhua Area					
Vangkhong Area					
Phonthan Area					
<b>2.C Stabilization and Increase in Agricultural Production</b>					
- Strengthening of Support System					
Thongharb-Nakhua Area					
Vangkhong Area					
Phonthan Area					
- Rehabilitation/Improvement in Irrigation Facility					
Thongharb-Nakhua Area					
Vangkhong Area					
Phonthan Area					

<b>Project Costs</b>
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Project plan	Strengthening of Farmers Groups / Organizations	Improvement in Agricultural Finance	Stabilization of Farming/Production Increase		
			Strengthening of support system	Rehabilitation and Improvement of Irrigation facility	Development of farm roads
Thongharb-Nakhua Area	<ul style="list-style-type: none"> <li>• Establishment of Water Users Group</li> <li>• Upgrading of WUA</li> <li>• Establishment of APG /ACG</li> </ul>	<ul style="list-style-type: none"> <li>• New staff recruitment for each branch offices</li> <li>• Introduction of mobile branch office</li> </ul>	Experts 48 M/M \$418,500	Construction of weir, development of farm land \$287,000	\$119,000
Vangkhong Area			Experts 37 M/M \$335,000	Transferring of existing pump station, Land reclamation and Canal construction \$205,300	\$112,300
Phonthan Area			Experts 63 M/M \$536,500	Elevating of the reservoir, Canal Construction \$130,000	\$90,000

ACG: Agricultural Credit Group

APB: Agricultural Promotion Bank

APG: Agricultural Production Group

BOL: Bank of Lao

SMS: Subject Master Specialist

WUA: Water Users Association

## Projects Evaluation

Main component	Sub-component	Overall Evaluation		
Master Plan		Whole Laos & 3Model Areas		
Farmers Organization	Establish groups/organization	2.00		
Improvement of Financial System	Improve financial System	2.13		
	Strengthening of Agricultural Promotion Bank	1.88		
Stabilizing of farming	Strengthen support system	1.89		
Model Area Development		Model Area		
		Thongharb- Nakhua Area	Vangkhong Area	Phonthan Area
Farmers Organizations	Establishment/strengthening of groups	1.75	2.00	1.63
Agricultural Finance	Strengthening of field offices	1.89	2.00	1.56
Stabilizing of Farming	Strengthening of support system	2.00	2.10	1.50
	Improvement/rehabilitation of. Irrigation System	1.91	1.71	1.64
	Rural/farm road construction	1.71	1.71	1.43

Method : Evaluating the following items by three grades, then averaging them

①Economy ②Finance ③Environment ④Organization ⑤Sociology ⑥Organization



- (1) Project Evaluation was conducted through farmers participating.  
 (2) The projects were justified as viable being with high evaluation scores and high feasibility

## Recommendations

### (1) Priority implementation of Human Resource Development

- 1) Central level
  - To integrate the existing extension systems,
  - To prepare a database of concerned staff,
  - To provide technical lecture and training for Provincial Agricultural and Forestry Service Office,
  - To prepare an inventory of irrigation facilities

#### 2) Intensive area activity

- To establish and to strengthen Water Users Group / Water Users Association,
- To establish and to strengthen Agricultural Credit group / Agricultural Promotion Group,
- To provide on-the-job training for planning and implementation of rehabilitation and construction of irrigation facilities under coordination of related organizations,

### (2) Strengthening of APB as Receiver of Two-step Loan

- 1) Bank of Lao
  - To establish and promote a domestic market for short-term finance,
  - To promptly improve the bank accounting system and its extension
  - To continue the present financial support to Agricultural Promotion Bank until the Agricultural Promotion Bank became capable to receive two-step-loan
- 2) Agricultural Promotion Bank
  - To reallocate institutional loan for long-term lending;
  - To implement external auditing and publish such documents
  - To promote the absorption of surplus rural fund through expansion of savings
  - Training in third countries for executives and middle class staff

#### 3) Farmer-Beneficiaries

- To cooperate with Agricultural Promotion Bank in simplifying the procedure for the institutional loan by organizing the Agricultural Credit group and Agricultural Promotion Group

### (3) Implementation of Phonthan Area Development as the highest priority

It is recommended to start from Phonthan Area, which has a high potential in development.

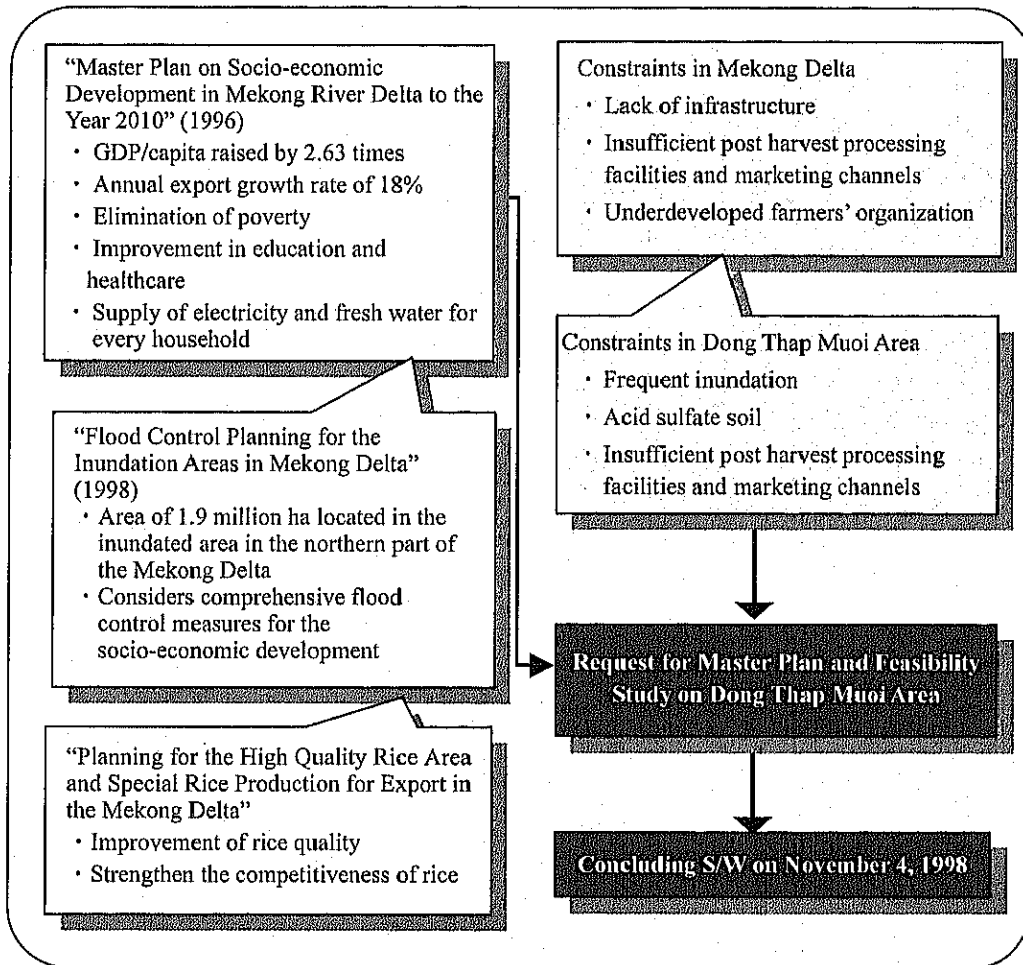
<b>The Study on Integrated Agricultural Development Plan in The Dong Thap Muoi Area</b>	Counterpart Agency	Ministry of Agriculture and Rural Development (MARD)
	Consultant Companies	Taiyo Consultants Co., Ltd. / Pacific Consultants International
	Team Leader	Haruo TSUCHIYA
	Study Period	1999. 4. 7 ~ 2000. 7. 30
	Study Type	Master Plan, Feasibility Study

**Background of the Study**

The Ministry of Agriculture and Rural Development in Viet Nam prepared an integrated development plan of “Master Plan on Socio-economic Development in Mekong River Delta to the Year 2010” in 1996, which sets development targets towards the year 2010.

Located in the northeastern part of the Mekong Delta, Dong Thap Muoi is persecuted by unstable agricultural production due to frequent inundation. This influences the farmer’s income in the area.

In this context, the Government of Viet Nam requested the Government of Japan for technical cooperation on the formulation of Agricultural Development for Dong Thap Muoi area. In response to the request, the Government of Japan conducted a preliminary study and had discussion among both Governments, then concluded the Scope of Works (S/W) on November 4, 1998, which defined detailed implementation plan of the development study.



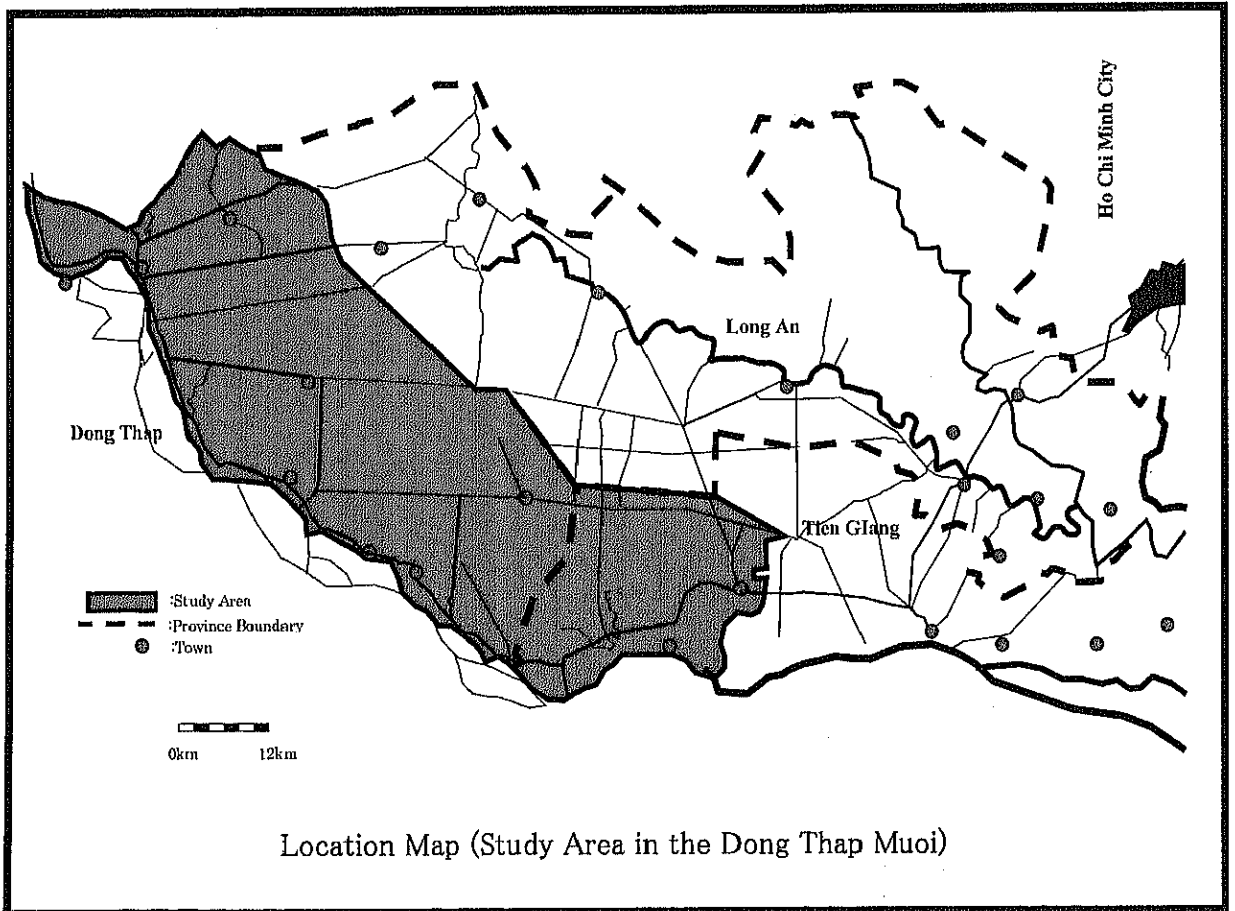
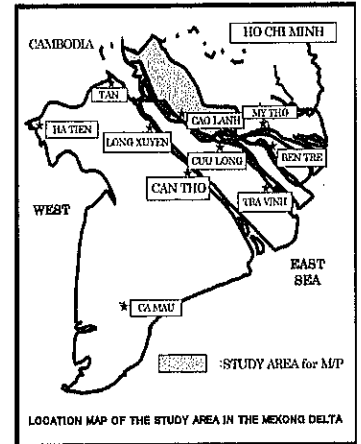
**Objectives of the Study**

- To formulate a Master Plan for Agricultural Development Plan in the Dong Thap Muoi area, which includes the followings,
  - ① Inundation mitigation
  - ② Improvement of storage, processing and marketing system of agricultural products
  - ③ Improvement of irrigation and drainage system
- To conduct a feasibility study for the priority projects/areas selected from the Master Plan
- To carry out technology transfer to the Vietnamese counterpart personnel through on-the-job

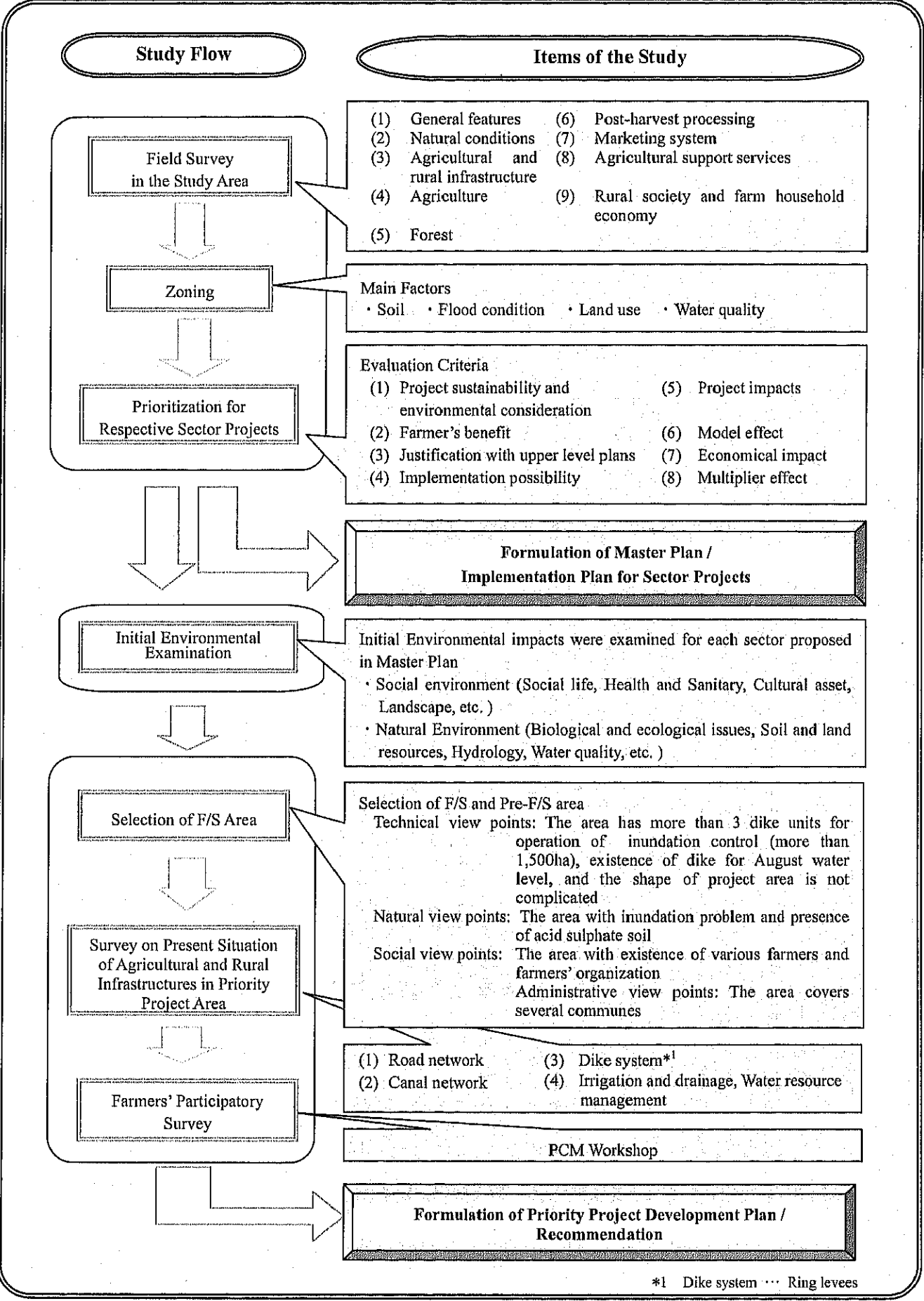
**Study Area**

- Northeastern part of the Mekong Delta, abut on Tien River and connecting to Cambodia border
- Total land area of the study area: 290,320ha
- Dong Thap Province: 228,700ha
- Tien Giang Province: 61,620ha

**Location Map**



**Study Items and Flow**



## Outline of the Plan

### Summary of the Plan

- |                           |   |
|---------------------------|---|
| (1) Target Group          | Farmers in the project area   |
| (2) Overall Goal          | Improvement of rural living standard<br>Increase of farmers' income   |
| (3) Project Objectives    | Inundation mitigation<br>Improvement of irrigation and drainage system<br>Improvement of agricultural products processing and marketing system  |
| (4) Proposed Plans        | Agricultural and rural infrastructure / Forest management / Post-harvest processing / Marketing system / environmental conservation / Agricultural support services / Rural credit / Farmers' organizations / Improvement of rice production and marketing system |
| (5) Main Projects         | Small dike system* <sup>1</sup> improvement plan, Rice production/marketing improvement plan  |
| (6) Expected Results      | 1) Flood control, inundation control, improvement of irrigation and drainage<br>2) Strengthening farmers' organization<br>3) Improvement of quality management system for agricultural products   |
| (7) Implementation period | 1) Small dike system improvement plan ... 5 years<br>2) Rice production/marketing improvement plan ... 2 years  |

\*1 Dike system ... Ring levees

### Master Plan

#### Agricultural and Rural Infrastructure Improvement Plan

- |   |   |
|---|---|
| (1) Flood control on boundary area                          | : Heightening dike roads and installation of control gates    |
| (2) Flood control on lower course of Nguyen Van Thiep canal | : Rehabilitation of 20 main canals (widening and dredging)    |
| (3) Small dike system improvement                           | : Inundation control with strengthening farmers' organization |

#### Forest Management Plan

- (1) Concentrated planting at government forestry areas :  
Unused land in the government forest area will be forested, and managed by national park.
- (2) Concentrated planting except government forestry areas:  
Unused land in Than Hong and Thah Binh district will be forested, and managed by the People's Committee of the relevant communes.
- (3) Environmental conservation forest zone:  
Environmental conservation forest zone will be improved. The DARD of the Dong Thap Provincial Government will be responsible for the management.
- (4) Border protection forest:  
A border protection forest will be planned for national security and flood prevention. The DARD of the Dong Thap Provincial Government will manage this forest.
- (5) Scattered planting :  
Scattered planting along roads, embankments and canals will be planned for the purpose of supplying fuelwood for local people and preventing soil erosion, etc.. Management responsibility lies on the People's Committee of the relevant communes.

#### Post-harvest Processing Improvement Plan

- (1) Training and extension of post-harvest processing (Quality control, Assessment study of post-harvest losses)
- (2) Improvement of farmer's facilities and equipments: drying yard, dryer, warehouse, etc.
- (3) Improvement of facility and equipment in processing factory
- (4) Model processing activities for producer's group

**Improvement Plan of Marketing System**

- (1) Establishment of model for collective marketing activities
- (2) Introduction and promotion of collective marketing activities
- (3) Enlargement of collection and distribution scale in production area
- (4) Improvement of fruit market information system
- (5) Establishment of wholesale market for collection and distribution in production area

**Environment Protection Plan**

- (1) Acid sulfate soil / water quality monitoring : strengthening monitoring system and accumulation of basic data

**Agricultural Support System Plan**

- (1) Strengthening plan of production and supply system for high quality rice seeds
- (2) Strengthening plan of production and supply system for high quality fruit seedling
- (3) Strengthening plan of agricultural extension and training system:  
Extension and training program for farmers' organization, Agricultural technique extension and training program, Post-harvest technique extension and training program, Forestry extension and training program
- (4) Agricultural machinery service program:  
Demonstration /training program, Agricultural machinery supply plan

**Rural Credit Plan**

- (1) Establishment of special fund for project implementation

**Farmers' Organization Plan**

- (1) Establishment and strengthening farmer's group for guiding and supervising activities in each sector

**Rice Production/Marketing Improvement Project (Integration Projects)**

Improvement of rice quality as well as increase in productivity should be handled as one system beginning from the stage of seeds production, cropping management by farmers to post-harvest processing and marketing. To this end, integrated approach covering all the following process should be adopted.

- Training and extension of post-harvest processing (Quality control, Assessment study of post-harvest losses)
- Improvement of rice processing facility and equipment
- Improvement of facility and equipment in processing factory
- Establishment of model for collective marketing activities
- Introduction and promotion plan of collective marketing activities
- Plan for production and supply of high quality rice seeds
- Agricultural extension and training plan
- Establishment of special fund for project implementation
- Establishment and strengthening farmer's group

**Plans for Priority Projects**
**Small Dike System Improvement Plan**
**Study Area**

	Province	District	Commune	Area(ha)
<b>Pre-F/S Area</b>				
Block④	Dong Thap	Thanh Binh	—	Total Area 21,200 ha Cultivated Area 18,000 ha
		Cao Lanh	—	
		Tam Nong	—	
Block⑧	Tien Giang	Cai Lay	—	Total Area 19,800 ha Cultivated Area 18,000 ha
		Cai Be	—	
<b>F/S Area</b>				
Block④	Dong Thap	Thanh Binh	Binh Thanh	Cultivated 18,000 ha
		Cao Lanh	Gao Giong	

Small Dike System Improvement Plan

**Layout Plan of Small Dike Units**

	Dike No.	Dike size	Total length of Dike
Block④	33	145~2,358ha (average 641ha)	345km
Block⑧	34	127~1,190ha (average 582ha)	340km

**Irrigation and Drainage Plan**

Irrigation Plan	Installation of water gates and culverts
Drainage Plan	Although excessive water within dike unit needs to be drained in high water season (July to September), present capacity of pump is enough for the drainage

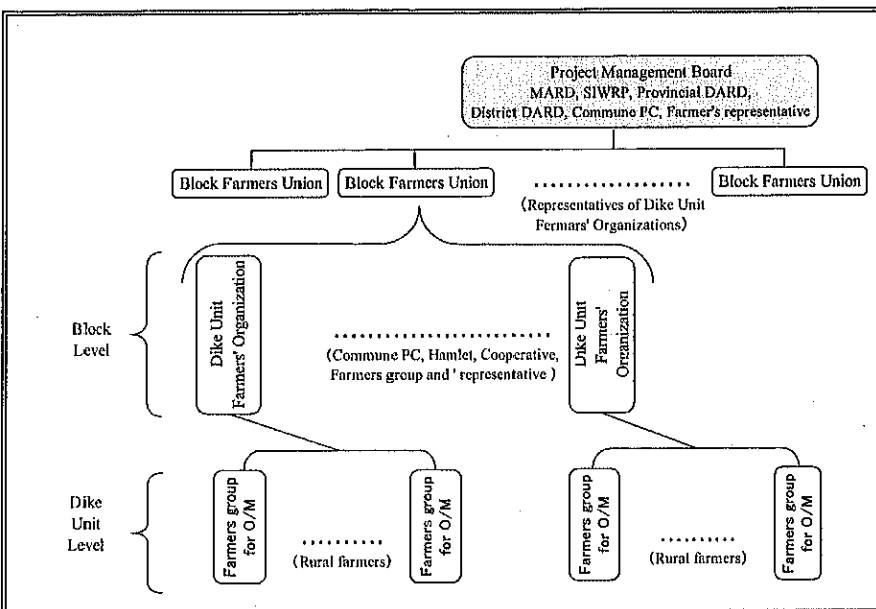
**Water Management Plan**

	Water management at dike level
Block④	Rotational inundation control by space
Block⑧	Rotational inundation control by time

**Facility Improvement Plan**

Dike	Elevation: Against flood at October with 10 years probability Width: 3.0m for bike road with laterite soil pavement, 5.0m for car road Slope: 1 : 1.5 Step: Step of 2.0m width is prepared on the slope inside for tree planting
Water gate	Water gates will be prepared so that boat transportation will be secured.
Culvert	"Cut and repair dike" water management will be replaced by culverts for the interconnection to small canals and drainage facility.
Control gate	Control gate will be installed on dike made with stop log, also possess the function as spillway.
Pier and approach	Some of the existing wooden pier will be removed during the construction, and reconstructed by farmers after dike improvement. In this plan, approach path from dike to pier will be prepared along the slope..
Rural road network	Dike system after improvement is utilized as basement of rural road network. Bridges for motorbike, and some for car, are proposed to be installed.

Organization Structure



Implementation Schedule

	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year
EIA and Consensus Building	[Progress bar]				
D/D and Tendering		[Progress bar]			
Construction			[Progress bar]		

Operation and Maintenance

Operation and Maintenance	Administrator
Patrol/inspection and light routine maintenance works	Dike O/M group consists of rural farmers
Periodic maintenance	Farmers' organizations for dike
Basically farmers will owe the maintenance cost collected as a part of irrigation fee.	

Project Costs

Construction Cost (million VND)	381,869
Consultants Services (million VND)	38,190
Land Compensation (million VND)	124,159
<b>Total Cost (million VND)</b>	<b>544,218</b>

US\$1 = VND14,061 = JPY109  
(As of March 2000)



## Rice Production/Marketing Improvement Plan

### Implementation Plan

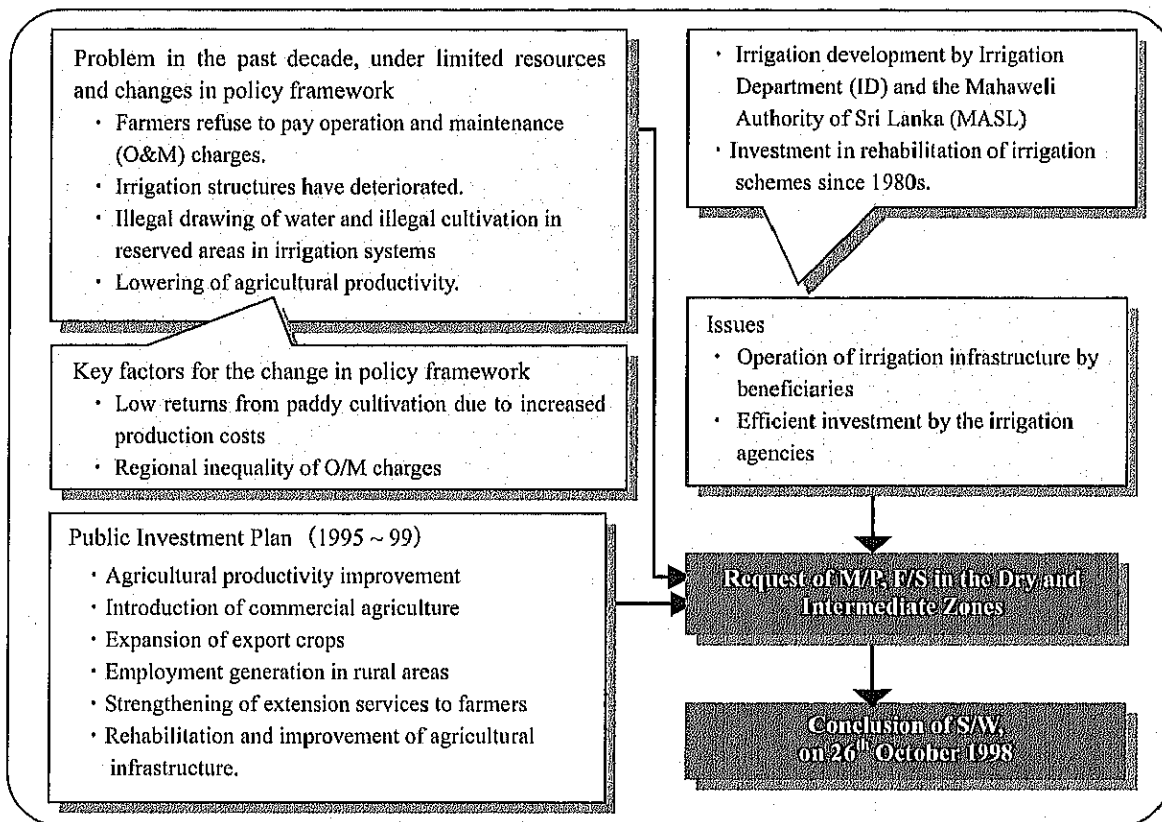
	Administrative Organization	Implementation Plan	Facility and Equipment Plan	Operation & Maintenance Cost
High Quality Seed Production / Supply Project	<ul style="list-style-type: none"> <li>• Department of Agriculture and Rural Development of Province (DARD)</li> <li>• Agriculture and Development Service company</li> <li>• Agricultural Extension Center</li> </ul>	<p>Seed replacement ratio at farmers level will reach to 10% in 2010.</p> <p>Production of foundation seed(F.S) 140 tons → 420 tons</p> <p>Production of certified seed(C.S) 2,600 tons → 8,500 tons</p>	<ul style="list-style-type: none"> <li>• An Phong and Dong Cat seed farms</li> <li>→ Arrangement of F.S production farms, Building facilities including management office, seed storage, drying facilities, etc.</li> <li>• 3 Seed Processing Center</li> <li>→ Building Drying facilities and maintain drying seed storage</li> <li>• Seed Control and Certification Division</li> <li>→ Installing laboratory facility</li> </ul>	<ol style="list-style-type: none"> <li>1. Seed farm &amp; seed processing center 13,063 mil. VND</li> <li>2. Seed inspection /control section 225 mil. VND</li> </ol>
Model Cooperative Strengthening Project	<ul style="list-style-type: none"> <li>• Model Cooperative (Gao Giong, Phu Tho)</li> <li>→ Introducing new organizational structures such as collective marketing and rice mill division</li> <li>• Project Management Board</li> <li>→ Organized from cooperatives, DARD, Agricultural Extension Center, Cooperative Alliance, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Production               <ul style="list-style-type: none"> <li>- Unification of regional variety and use of high quality seeds</li> <li>- Improvement of cultivation control technique</li> <li>- Complete drying by introducing mechanical dryer</li> <li>- Implementing collective marketing</li> <li>- Introduction of milling facility</li> </ul> </li> <li>• Business Operation               <ul style="list-style-type: none"> <li>- Training courses for leaders and staffs on management, finance / accounting</li> <li>- Technical training for collective marketing and rice milling</li> </ul> </li> <li>• Collective marketing / Rice milling               <ul style="list-style-type: none"> <li>- Systematic quantitative management of collection, processing and delivery time of rice based on market demand</li> </ul> </li> </ul>	<p>Arrangement of facilities and equipment related to collective marketing and processing activities at model cooperative (Gao Giong, Phu Tho) , which include drying facilities, rice milling facilities, storage, etc.</p>	
Training / Extension System Improvement Project	Agricultural Extension Center	<ul style="list-style-type: none"> <li>• Seed Production Training for seed growing farmers and local officials</li> <li>• Post Harvest Processing / Marketing               <ol style="list-style-type: none"> <li>① Improvement of farmer's practice for post harvest technology,</li> <li>② Improvement rice miller's skill for processing and factory management,</li> <li>③ Extension of inspection and quality control technique</li> </ol> </li> <li>• Farmers' Organization Strengthen organizational management capability through training programs for leaders, seniors and management staffs (mainly finance and accounting)</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural Extension Center</li> <li>→ Training center, training equipment (including training facility of rice processing)</li> <li>• Rice processing facility</li> <li>→ Rice mill equipment, flat bed type dryer, equipment and tools for inspection and quality control</li> </ul>	<ol style="list-style-type: none"> <li>1. Training Center 213 million VND</li> <li>2. Training facility for rice processing 124 million VND</li> </ol> <p>Total 337 million VND</p>



<b>The Study for The Potential Realization of Irrigated Agriculture in The Dry and Intermediate Zone of Sri Lanka</b>	Counterpart Agency	Ministry of Irrigation and Power
	Consultant Company	NIPPON KOEI CO., LTD
	Team Leader	Tadaharu MURONO
	Study Period	1999.3~2000.10
	Study Type	Master Plan, Feasibility Study

**Background of the Study**

Many irrigation schemes have been developed by the Irrigation Department (ID) and the Mahaweli Authority of Sri Lanka (MASL), to establish profitable agriculture in these zones. However, returns on investments in irrigation schemes have not been commensurate with either investments, or efforts exerted by line agencies in servicing for these schemes. Operation and improving management efficiencies of irrigation systems by beneficiaries has become one of the main concerns of the irrigation agencies in the recent past. In the Plan of Public Investment (1995-99), the Government put the higher priorities on increasing agricultural productivity of cash crops, introduction of expansion of export crops, generation of employment opportunities in rural areas, which will contribute to lowering of population pressure in urban areas, strengthening of extension services for farmers, rehabilitation and improvement of agricultural infrastructure, etc. In this context, the Government of Sri Lanka requested the Government of Japan to provide technical co-operation for the execution of the Study for Potential Realization of Irrigated Agriculture in the Dry and Intermediate Zones of Sri Lanka. JICA made a preliminary study and secured coordination of the two Governments, and concluded a scope of the work (S/W) for the study on 26<sup>th</sup> October 1998.



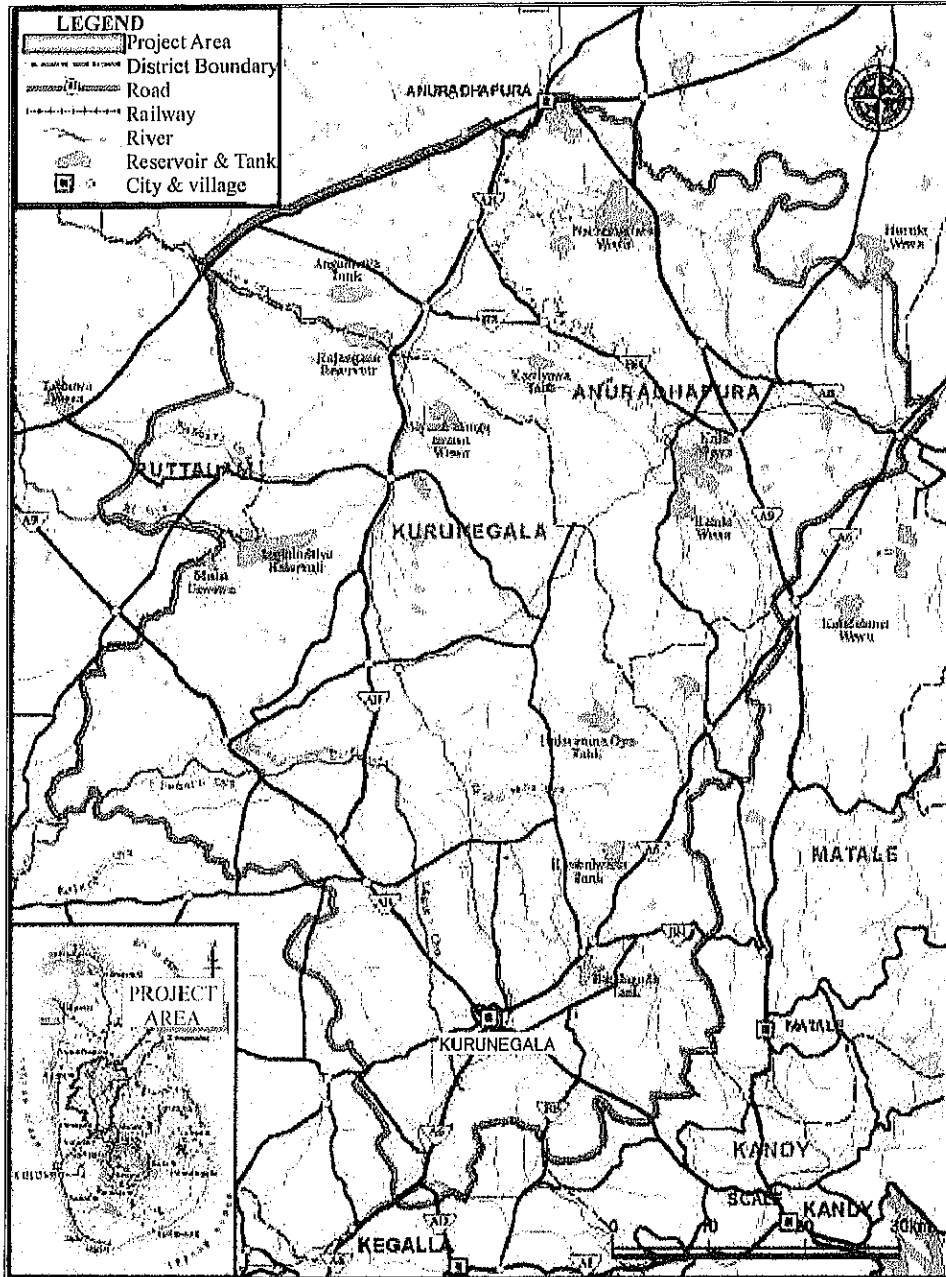
**Objectives of the Study**

- The objective of this Study is to prepare a Master Plan for the Potential Realization of Irrigated Agriculture in the Dry and Intermediate Zones with the goal of achieving more profitable agriculture and higher standards of living for rural farm households through facility rehabilitation, efficient use of water with participatory management, improvement of support services for farmers including credit and marketing.
- To conduct a Feasibility Study on selected priority projects.

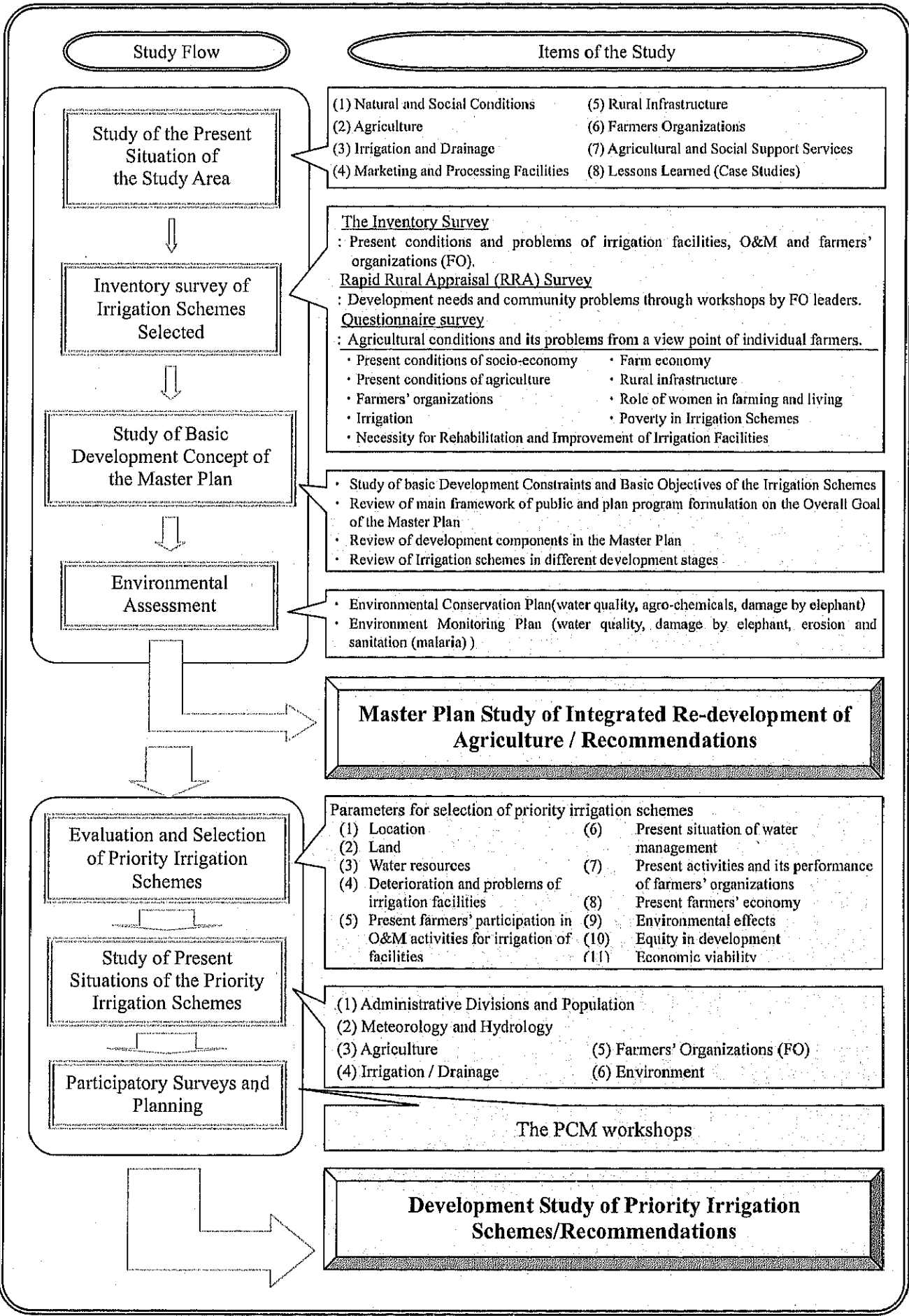
**Study Area**

- The four districts of Anuradhapura, Kurunegala, Puttalam, and Matale.
- The area to be covered by the Study is estimated at about 6,500km<sup>2</sup>

**Location Map**



**Study Items and Flow**

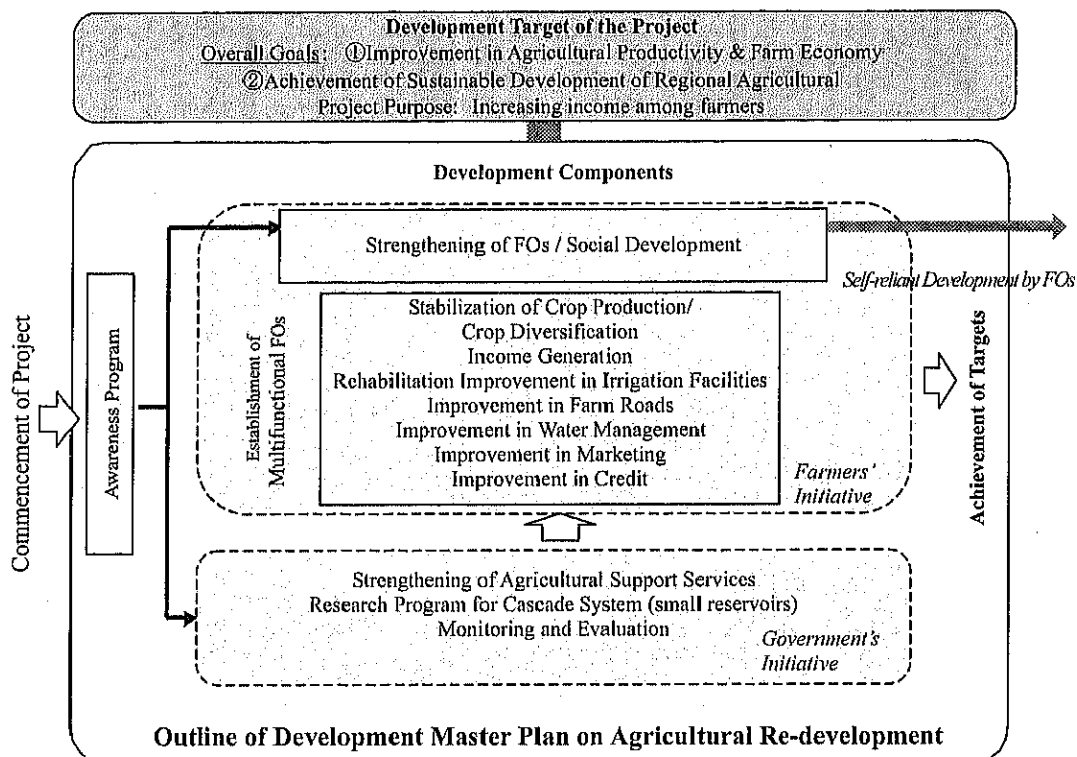


## Outline of the Plan

### Summary of the Plan

- |                            |   |
|----------------------------|---|
| (1) Target Groups          | Farmers/Community's People in the Study Area  |
| (2) Overall Goals          | <ul style="list-style-type: none"> <li>• Improvement in agricultural productivity and farm economy</li> <li>• Sustainable development of rural agriculture</li> </ul>   |
| (3) Objectives of the Plan | Income generation of farm household   |
| (4) Proposed Projects      | Awareness Program of the plan / Strengthening of Farmers' Organizations and Community Development / Agricultural Production / Income Generation / Improvement in Marketing and Agricultural Credit / Rehabilitation and Improvement in Irrigation Facilities and Farm Roads / Improvement in Operation and Maintenance of Irrigation Facilities and Water Management / Proposed Plan for Strengthening of Agricultural Supporting Services / Research Program of Cascade System and Subsurface Water / Monitoring and Evaluation of the Project |
| (5) Main Projects          | Strengthening of Farmers' Organization and Community Development / Distribution of Proper Irrigation Water / Improvement of Agriculture Activities / Proposed Plan for Strengthening of Agricultural Supporting Services / Environmental Conservation Plan  |
| (6) Expected Results       | <ol style="list-style-type: none"> <li>1) Establishment and strengthening of multipurpose Farmers' Organizations</li> <li>2) Proper irrigation water distribution</li> <li>3) Improvement in agriculture activities</li> </ol>  |
| (7) Target year            | 7 years   |

## Outline of Master Plan for Agricultural Re-development



### Environmental Assessment

#### Environmental Conservation Plan

- Land Management for the Rainfed Uplands Crops
- Proper Use of Chemicals
- Water Quality Conservation
- Mitigating Elephant Damage
- Management of Water-born Diseases
- Education Training and Extension

#### Environmental Monitoring Plan

Monitoring by Implementation Agencies Concerned and Farmers' Organizations

- Soil Erosion
- Water Quality
- Public Health
- Mitigation of Elephant Damage

## Development Plan for Priority Irrigation Schemes

### Target Areas

Scheme	Object	Area of Irrigation (ha)
Nachchaduwa Major scheme	Improvement in farmers' income	2,540
Palukadawela Major scheme	Establishment in suitable economic level	956
Periyakulama Medium	Improvement in economic status of farmers	91
Mahananneriya Medium	Improvement in socio-economic conditions	158
Mahananneriya Minor Cascades	ditto	117

### Strengthening Farmers' Organizations (FOs)

- To conduct awareness and training programs.
- To reorganize multifunctional FOs
- To carry out income generation through FOs.
- To construct farmer centers.

#### Education/Training Programs for FO Leaders

Training Subjects	Contents
1) Draft preparation of articles for Organization amendments	Draft preparation of Articles of Organization and knowledge of the system and the procedures required.
2) Practical training of the basic operation and management of organizations	Planning, participatory management, operation & management of FOs, financial management, financial resource management, role & systems of officials concerned, etc.
3) Training for the income generation activities	Practical training of the operation/management of the rural credit (Group-loan, Revolving-loan) and co-operative purchasing /selling.
4) Information network formation / Awareness training	Establishing information networks with external organization's for collecting and sharing information in and around the community.

### Proper Distribution of Irrigation Water

- To rehabilitate and to improve irrigation facilities.
- To improve water management.
- To strengthen O&M of irrigation facilities.

Category	Item	Nachchaduwa Major	Palukadawela Major	Periyakulama Medium	Mahananneeriya Medium	Mahananneriya Minor Cascade
Reservoir (Tank)	Bode of Dike	Strengthening Embankments, Gravelling of the crest, Rip-rap in downstream, Filter toe drain	Same as the left	Slope protection, Gravelling of the crest	Strengthening Embankments, Gravelling of the crest, Rip-rap in downstream, Filter toe drain	Widening of the bund, Slope protection, Strengthening of embankment
	Inlet Works	Repair of concrete works, protection of the downstream, Measuring device	Minor repairs, Downstream protection, Measuring device	Replacement of 3 sluices	Minor repairs, Downstream protection, Measuring device	Repairs and replacement of sluices
	Spillway	Repair of concrete works	Minor repairs	Rehabilitation of downstream drainage	Concrete repair works	Minor repairs, Downstream protection
	Others	Repair of O&M Roads	Bathing steps for animal			De-silting, Bathing steps for animal
Main canal	Earthworks	15 km	16.3 km	900 m	3,500 m	3,300 m
	Lining	7 km	16 Nos.	330 m	90 m	
	Structures	180 Nos.	78 Nos.	24 Nos.	60 Nos.	52 Nos.
	O&M Road	26 km	16.3 km	330 m	2,300 m	2,000 m
Lateral canal	Earthworks	16 km	11.2 km	3,500 m		
	Lining	21 km	5 Nos.			
	Structures	230 Nos.	96 Nos.	47 Nos.		
	O&M Road	18 km	11.2 km			
Un-farm canal	Earthworks	17 km	0.6 km	2,500 m		
	Lining	38 km	0.8 km			
	Structures	122 Nos.	71 Nos.	22 Nos.		
	O&M Road	45 km	20.7 km			
Others	Small Tank	11 Nos.	18 Nos.		Spillway 7 Nos.	
	Feeder Canal	L.S.	L.S.	600 m		

### Improve agricultural activity

- To promote OFC (Other Field Crops) cultivation.
- To strengthen agricultural extension activities.
- To improve marketing of agriculture inputs and outputs.
- To improve credit services.
- To promote reforestation in catchments areas.
- To establish elephant protection systems in FO (Farmers' Organizations)

**Proposed Plans for Strengthening of Agricultural Support Services**

Support Programs	Institutions
<b>Institutional Strengthening Programs</b>	IPEU, PDOAs (NCP & NWP)
1) Logistic support strengthening	
2) Staff training program	
3) Institutional strengthening	
4) Upgrading ISTL, M. Iluppallama	
<b>Strengthening of Farmers/FOs Support Institutions &amp; Facilities</b>	DAS, Kurunegala & Anuradhapura
1) Establishment of "Farmer Center"	
2) AS Center strengthening program	
3) Institutional strengthening program	
<b>Support Programs for Income Generation</b>	
1) Upgrading of the Provincial Seed Farm, Galgamuwa	PDOA, NWP
2) Upgrading of IFTC, Nikaweratiya	PDAPHs, NWP
3) Establishment of AEC, Anuradhapura	NAQDA

**Environmental conservation Plan**

- Monitoring of elephant damages
- Monitoring of soil erosion and public health (malaria)
- Monitoring of water quality (It is necessary that the executing agency carry out the water quality analysis in suspect areas twice a year over a period of two to three years.)

**Organization Structure**

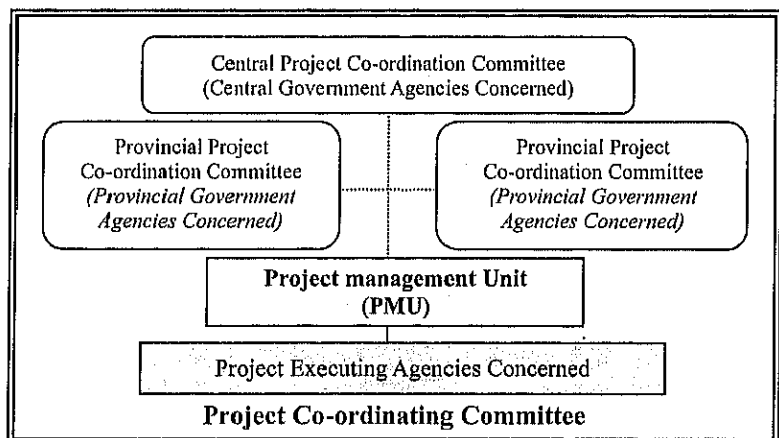
Development Programs	Implementing Agencies										
	PDOA /IPEU	DOI	PED	IMD	DAS	PDAPH	NAQDA	NYSC	NAITA	DS	KARTI
<b>Awareness Programs</b>											
Strengthening of FOs and communit development	Major scheme										
	Medium & Minor scheme										
Agricultural Development (stable crop production and crop diversification)											
Income generation	Home gaarden development										
	Livestock development										
	Fishery development										
	Vocational training										
	Small enterprises and business development										
Improvement in marketing											
Improvement in credit											
Rehabilitation and improvement in irrigation facilities	Major scheme										
	Medium & Minor scheme										
Improvement in water management	Major scheme										
	Medium scheme										
	Minor scheme										
Improvement in farm roads											
Strengthening in agricultural support services											
Research program of cascade system and subsurface water											
Monitoring and evaluation											

PDOAs :Provincial Department of Agriculture  
 IPEU :Inter Provincial Extension Unit  
 DOI :Department of Irrigation  
 PED :Provincial Engineering Department  
 IMD :Irrigation Management Division  
 DAS :Department of Agrarian services  
 PDAPH :Provincial Department of Animal Prodection & Health

NAQDA :National Aquaculture Development Authority  
 NYSC :National Youth Service Council  
 NAITA :National Appretice & Industrial Training Authority  
 DS :Divisional Secretarial  
 KARTI :Kobbekaduwa Agrarian Research and Training Institute

In order to co-ordinate all these agencies, the Central Project Co-ordination Committees (CPCC) and the Provincial Project Co-ordination Committees (PPCC) will be established. And The Project Management Unit (PMU) will be established of the project site, and will have direct responsibility for the implementation of the programs. The organizational structure of PMU will consist of seven sub-units.

- ①Administration Unit
- ②Agricultural Supporting Unit
- ③Construction Unit
- ④O&M of Irrigation Schemes Unit
- ⑤Income Generation/Social Service Unit
- ⑥Farmers' Supporting/Credit Unit
- ⑦Monitoring and Evaluation Unit





### Implementation Schedule

Major Project Works		1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year
1.	Mobilization of PMU (including CPCC & PPCC)	■							
2.	Awareness Program	■	■						
3.	Implementation of the Development Programs								
	1) Strengthening of FO		■	■	■	■	■	■	■
	2) Rehabilitation and improvement of irrigation facilities and farm roads								
	One major schemes		■	■	■	■	■	■	■
	Survey, design & tendering	■	■						
	Construction and supervision			■	■	■	■	■	■
	One medium & minor schemes								
	Survey, design & tendering	■	■						
	Construction and supervision		■	■	■	■	■	■	■
	3) Improvement in water management, stable crop production and crop diversification, improvement in marketing and credit, income generation		■	■	■	■	■	■	■
	4) Research program of cascade system and subsurface water		■	■	■	■	■	■	■
4.	Monitoring and Evaluation (including base line survey, bench mark survey, workshop with farmers, PCM, monitoring of environment)	■	■	■	■	■	■	■	■
5.	Project Evaluation and Follow-up Program							■	■

### Project Costs

(Unit: Rs. Million)

	Commanding Area (ha)	Rehabilitation Cost *1	Capital for Support Facilities*1	Awareness and Training*1	PMU Administration and Loan*1	Engineering Cost *1	Total
Nachchaduwa Major Scheme	2,540	395.1	67.0	27.5	51.4	49.1	590.1
Palukadawela Major Irrigation Scheme	956	58.7	27.6	12.2	19.9	9.8	128.2
Periyakulama Medium Irrigation Scheme	91	17.9	1.7	1.6	1.9	2.1	25.2
Mahananneriya Medium Scheme	158	14.0	4.4	2.3	4.0	2.0	26.7
Mahananneriya Minor Schemes (Cascade)	117	15.2	9.1	5.2	2.9	2.8	35.2
<b>Total</b>	<b>3,862</b>	<b>500.9</b>	<b>109.8</b>	<b>48.8</b>	<b>80.1</b>	<b>65.8</b>	<b>805.4</b>
Proportional Extent		62%	14%	6%	10%	8%	100%
Cost per Hectare	(Rs./ha)	129,700	28,400	12,600	20,700	17,000	208,400
	(US\$/ha)	1,830	400	180	300	240	2,950

Remarks : \*1 Including physical contingency

Exchange Rate US\$1.0 = Rs.71.

### Operation and Maintenance Costs

	Farmers' share (Rs./ha/year)	Government's share (Rs./ha/year)	Total (Rs./ha/year)
Major Schemes	1,000	1,000	2,000
Medium and Minor Schemes	1,500	—	1,500
<b>Total</b>	<b>2,500</b>	<b>1,000</b>	<b>3,500</b>

Exchange Rate US\$1.0 = Rs.71.

\* Among the costs shared by the farmers, the amount of Rs. 500/ha will be allocated as an allowance to gate operators. The remaining costs will be used for the maintenance of irrigation facilities. The maintenance costs are composed of material and labor costs. They are in the ratio of 3:7.

\* The replacement cost is estimated, assuming that the steel gate of irrigation facilities, O&M equipment, vehicle, and equipment for extension and training, will be replaced every 10 years, and building every 25 years.

## Project Evaluation

Economic Evaluation		Financial Evaluation		
EIRR (Economic Internal Rate of Return)	(%)	Net income increased	(Rs./household/ year)	Cash flow
Nachchaduwa Major Scheme	17.2	Whole Average	38,200	-Repayment of the loan is Rs. 56 to Rs. 80 million / year from 10 <sup>th</sup> to 30 <sup>th</sup> years. -The farmer's bear Salaries and the O&M cost In Major Schemes ...Rs.150/ha/year In Medium and Minor Scheme ...Rs.300ha/year
Palukadawela Major Irrigation Scheme	21.3	0.4 - 0.8ha	24,700	
Periyakulama Medium Irrigation Scheme	9.8	Less than 0.4ha	10,900	
Mahananneriya Medium Scheme	26.1	The average gross income of farmers in all priority schemes would increase about 40% from the present level.		
Mahananneriya Minor Schemes(Cascade)	26.1			

### Social / Economic Impact

- Regional economy will be activated by increasing the purchasing power of the beneficiary farmers.
- Improvement in employment opportunities, increase in non-farm income and alleviation of poverty.
- Women's participation will be activated and their social status will be improved.
- Social problem (alcohol addiction) will be reduced by FO's social services.
- Damage caused by elephants will be decreased by organized protection by FO.
- Forest devastation and soil erosion in the catchment area will be decreased by the reforestation program, etc.



- (1) The project implementation is economically, financially and environmentally feasible.
- (2) It will contribute to the economy and people in the priority irrigation schemes in the whole dry and intermediate zone.

## Recommendations

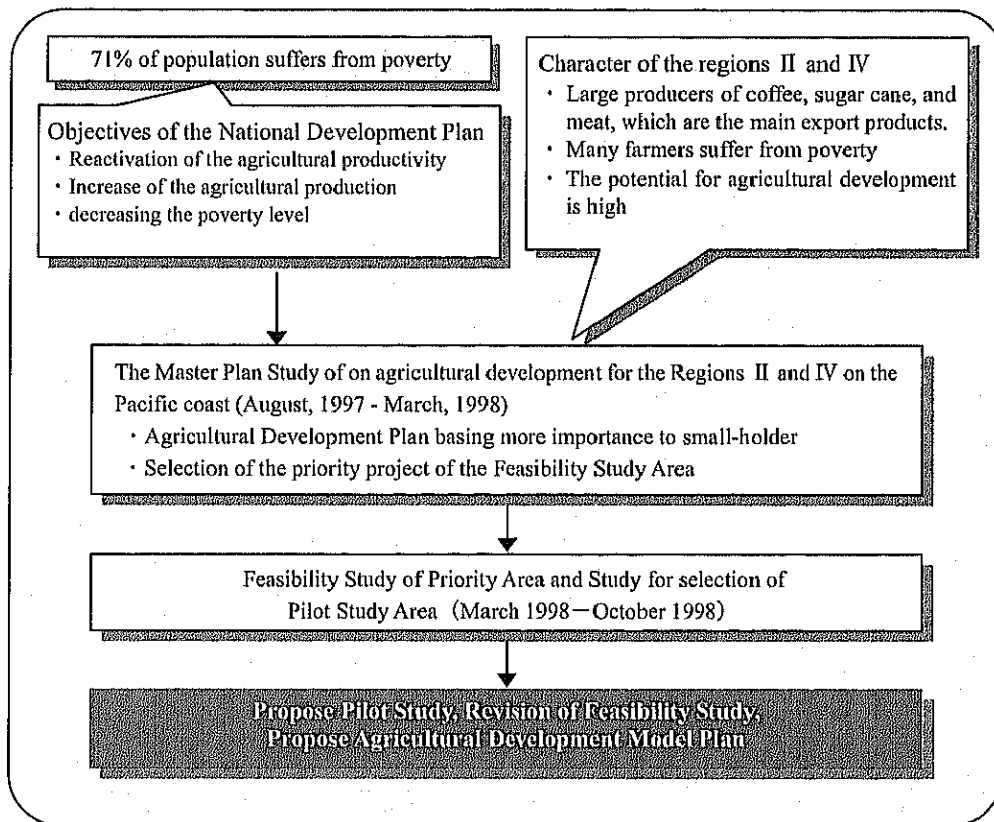
- (1) The Project in the priority schemes should proceed in its implementation, establish the implementation system, and then proceed to initiate development of the Master Plan area.
- (2) Through the awareness programs, the capability in participatory development of the officials concerned should be increased and the implementation system is established in the official institutions concerned.
- (3) Development of the five priority schemes should be implemented together.
- (4) The Central Project Co-ordination Committees (CPCC) should be established in the central government and the Provincial Project Co-ordination Committees (PPCC) should be established in the provincial government.
- (5) The Project Management Unit (PMU) should be established under the Ministry of Irrigation and Power.
- (6) Respective mandates of the Department of Agrarian Service, the Irrigation Management Department and the Irrigation Department, should be clarified in order to carry out the Project and make effective use of the project cost.

**The Study on Agricultural Development  
for the Region II and IV  
in The Pacific Coast**

Counterpart Agency	Ministry of Agriculture, Livestock and Forestry (MAG-FOR), Nicaraguan Institute for Agricultural Technology (INTA)
Consultant Company	Pacific Consultants International Asia Air Survey Co, Ltd.
Team Leader	Takashi FUJITA
Study Period	1998.10~2000.6
Study Type	Feasibility Study, Pilot Study

**Background of the Study**

The agricultural sector of Nicaragua is one of the central industries. The Government of Nicaragua emphasizes within the National Development Program, the increases of the agricultural production and the reduction of poverty levels, giving high importance to the reactivation of the agricultural productivity. But the results expected by the government have not been achieved so far. Regions II and IV are traditionally agricultural centers of Nicaragua, and large producers of coffee, sugar cane, and meat, which are the main export products. In spite of this, many poor farmers live in those regions. Under these circumstances, in December of 1995, the Government of Nicaragua requested the Government of Japan help to extend its assistance in the elaboration of an agricultural development project to put stress on smallholder in Regions II and IV where the potential for agricultural development is high within the region of the pacific coast. JICA conducted the Master Plan Study of agricultural development in the Regions II and IV on the Pacific coast from August, 1997 to March, 1998. It executed the Feasibility Study of the priority projects and selection of the project areas of the Pilot Study in 1998. On the bases of these studies, it executed the Pilot Study, and proposed Revision of the Feasibility Study and Agricultural Development Plan. It is described about the Pilot Study, the Revision of the Feasibility Study and Agricultural Development Model Plan in this report.



**Objectives of the Study**

- Farmers will be organized and agricultural development plan that was planned with the participation of the Farmers' Organization will be promoted in the two F/S areas, Telica area and El Espino area, that were selected through the results of the M/P Study.
- Through implementation of P/S, its monitoring and evaluation, Draft Final Report will be revised and the Final Report based on the revision of its draft will then be prepared.