

17.3.3 Periyakulama Medium Scheme

(1) General

Periyakulama medium scheme is located in the midpoint of Anuradhapura and Dambulla. Total number of farm households is 210 and the irrigated paddy area is 91 ha. There is one Farmers' Organisation organised in the scheme and the present situation is shown in Table 15.1.1.

The PDM of Periyakulama scheme is shown on page 17-35. The development plan is formulated as "Economical status of the rural community is improved" for the Project purpose and the target group is farmer/community. The detail contents are given in the table of the Plan of Operation of page 17-36 and the Project layout map on page 17-38.

(2) Strengthening Farmers' Organisation

The concrete plans for the strengthening FO programmes are as follows.

1) Awareness Programme and Educational/Training Programmes

Awareness programme

Awareness programme is applied for the both "Farmers" and "Official institutions" as mentioned before. Its contents and implementation procedure are as detailed in Section 9.2. The multifunctional FO is to be established through this programme with the self-motivation of the entire community.

Education/ training programme

Following education and training programmes for fostering leaders of the multifunctional FO are to be conducted.

Education/Training Programmes for FO Leader – Periyakulama Medium Scheme

Training Subject	Contents	Training Method
1) Draft preparation of the Articles of Organisation amendment	Draft preparation of the Articles of Organisation and knowledge of the systems and the procedures required on the process.	Lecture in Tirappane Agrarian Service Centre (ASC/DAS) and practical training by Farmer Animator.
2) Practical training the basic operation and management of the organisation	Planning, participatory management, practical operation & management of FO, practical financial management, financial resource management, role & systems of Official concerned, etc.	
3) Training on the income generation activity	Practical; training of the operation/management of Rural Credit (Group-loan, Revolving-loan) and co-operative purchasing/selling.	Lecture by ASC/DAS, IMD, private bank (PMU arranges with banks) & practical training by Farmer Animator.
4) Information network formation/Awareness training	Establishing information networks with external organisations for collecting and sharing information in and around the community.	Holding workshops by External organisations and 14 FOs for sharing information.

These programmes are to be conducted separately from the Awareness programme within the regular works of Tirappane ASC. Education and train-

ing facilities of Tirappane ASC are to be improved and strengthened (refer Chapter 17.4).

2) Establishment of Multifunctional Farmers' Organisation

The present FOs are to be reorganised to be multifunctional. The reorganisation is determined in the general meeting of the entire community, which conducted the awareness programme mentioned previously. The organisation is to provide various services to farmer/community and to be fostered as an autonomous organ representing the community. Major change on the reorganisation is to set subcommittee under the executive committee and to act on irrigation, agriculture, business of FO, and income generation/social services.

Setting up Farmers' Subcommittee – Periyakulama Medium Scheme

Subcommittees	Purposes and Activities
1) Irrigation	i) Water management, ii) O&M of facilities, iii) Safety operation of irrigation facility, iv) Estimation & collection of Irrigation Service Fee (ISF), and v) Survey on lease/tenant of farmland
2) Agriculture	i) Collaboration with official extension works, ii) Holding technical extension seminar, iii) income generation activity (Home garden and live-stock development), iv) Operation of group works as pest control, v) Re-forestation in the catchment area (Fruits trees), and vi) Control elephant damage (strengthening control by FO)
3) Businesses of FO	i) Establishment and operation of co-operation purchasing/selling, Pola/collection point, ii) Operation and management of the rural credit service (group loan, revolving loan), iii) Business of FO as farm machinery rental service, inland fishery, agro-processing, etc.
4) Income generation/Social Services	i) Income generation activities such as vocational training, small-scale enterprise/business, self-employment, ornamental fish culture and collection of employment information, ii) Promotion of mutual aid credit system, iii) Financial support for income generation, and iv) Promotion of anti alcohol addict campaign, social welfare, health & sanitary improvement.

An audit section is proposed to be set in order to maintain transparency of FO activity and employing volunteer for close communication with FO members. The audit section is to check periodically and report to the general meeting. The volunteers are to work on communication among the executive committee, the subcommittee and the members.

Problem on the possession of irrigation water by the old paddy owners is existing in Periyakulama scheme. For the solution to this, improvement of FO's status in the community and appropriate management of the irrigation water by FO are needed.

3) Income Generation/Social Services through Farmers' Organisations

The subcommittees of "Agriculture" and "Income Generation/Social Services" are carried out income generation activities for farmers and community. The contents of activity are as mentioned in the previous section 2).

The income generation/Social services are carried out by the self-motivation of FOs and are targeting poverty groups of the community. Necessary

information is to be provided through Tirappane ASC and Farmer Animators. The training facilities of NYSC are to be utilised for vocational training, so that no extra facility is constructed by the Project.

4) Construction of Farmer Centre

There is a farmer centre of FO constructed by DOA in Periyakulama scheme. Therefore, a new farmer centre is not to be constructed.

(3) Distribution of Proper Irrigation Water

1) Rehabilitation and Improvement Plan of Irrigation Facilities

The rehabilitation and improvement works in Periyakulama medium scheme are as follows:

Rehabilitation and Improvement Plan – Periyakulama Medium Scheme

Category	Item	Quantity	Description of works
Tank	Bund	L.S.	Slope protection, Graveling
	Sluice	3 Nos.	Replacement of sluices
	Spillway	L.S.	Rehabilitation of downstream channel
	Others	L.S.	
Main canal	Earthworks	900 m	Earth filling
	Lining	330 m	Masonry lining
	Structures	24 Nos.	Turnout, Regulator, Culvert
	O&M Road	330 m	Earth filling, Graveling
D-canals	Earthworks	3,500 m	Earth filling
	Structures	47 Nos.	Turnout, Culvert
F-canals	Earthworks	2,500 m	Earth filling
	Structures	22 Nos.	Turnout, Regulator, Culvert
Other	Drain	600 m	Excavation

The deteriorated three sluice structures in the tank are replaced. Off-takes with gate are provided for proper water distribution on the main canal. Other works include masonry lining in the canal and O&M road along the main canal.

The works for tanks and main canals are to be carried out by constructors and the works for D-canals and F-canals are to be conducted by contractors or farmers. The training courses for rehabilitation and improvement works are programmed in order to reflect farmers' intention to the works properly and to smoothly carry out the works by the farmers. The following training course for the government staff and the farmers is to be conducted.

Training Programme for Rehabilitation and Improvement Works – Periyakulama Medium Scheme

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1 day, pre-construction	RATPA	Participatory planning Communication with farmers
	Second	1 day, in the construction	ID	Skill of technology transfer to farmers
	Third	1 day, post-construction	ID	Hand-over of O&M responsibility to farmers, follow-up programme

(continued)

Training for farmers	First	2 days, pre-construction	RATPA	Participatory planning Field investigation, design and cost estimate
	Second	2 days, pre-construction	ID	Contract for rehabilitation works, farmers' contribution
	Third	1 day, in the construction	ID	Quality control for earthworks and concrete, preparation of document for rehabilitation, field inspection
	Fourth	1 day, post-construction	ID	Follow-up programme

RATPA: Research and Advisory Team for Participatory Approach

Education/training for officers is one course for TA and WS of Anuradhapura ID. One course is conducted for farmers, the office bearers of FOs and the subcommittee members.

2) Training for Water Management

The water management training for the government staff and farmers are proposed as follows:

Training Programme for Water Management – Periyakulama Medium Scheme

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1 day, pre-construction	RATPA	Awareness programme Communication with farmers
	Second	1.5 days, post-construction	ID	Estimation of water requirement, preparation of water distribution programme, skill for gate operation of tank and off-takes, flow measurement and flow monitoring, skill of technology transfer to farmers
	Third	1 day	ID	Follow-up programme
Training for farmers	First	1 day, pre-construction	RATPA	Awareness programme, communication with government staff, communication among farmers, communication with other FOs
	Second	1.5 days, post-construction	ID	Preparation of water distribution programme, skill for gate operation of tank and off-takes
	Third	1 day	ID	Follow-up programme

RATPA: Research and Advisory Team for Participatory Approach

Education/training for officers is one course for TA and WS of Anuradhapura ID. One course is to be conducted and farmers, the office bearers of FOs and the subcommittee members are to be participants. The gate operation method for newly constructed canal structures is required to train enough. After completion of the rehabilitation works, all facility management is to be transferred to FO. The major objectives of training for officers are for improving capability of technical guidance to farmers.

3) Training for O&M of Irrigation Facilities

The training for O&M of irrigation facilities for the government staff and farmers are proposed as follows:

Training Programme for O&M – Periyakulama Medium Scheme

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1day, pre-construction	RATPA	Awareness programme
	Second	1.5days, post-construction	ID	Preparation of O&M plan, patrol manual, Sramadana practice manual, O&M fee collection method, skill of technology transfer to farmers
	Third	1day	ID	Follow-up programme
Training for farmers	First	1day, pre-construction	RATPA	Awareness programme
	Second	1.5days, post-construction	ID	Preparation of O&M plan, patrol manual, Sramadana practice manual, O&M fee collection method
	Third	1day	ID	Follow-up programme

Education/training for officers is one course for TA and WS of Anuradhapura ID. One course is to be conducted and farmers, the office bearers of Fos, and the subcommittee members are to be participants.

(4) Improvement of Agriculture Activities

1) Promotion of OFC Cultivation

Water resource potential of Periyakulama scheme is not high and its potential for increasing cultivation area after the project implementation is also low (refer Section 9.4.3), therefore OFC promotion cropping pattern is proposed. The proposed cultivation area and production of respective crop are as follows, and Figure 15.3.1 shows the proposed cropping.

Cropping Area and Production With & Without Project – Periyakulama Scheme

	Without Project			With Project			Increase (ton)
	Area (ha)	Yield (ton/ha)	Production (ton)	Area (ha)	Yield (ton/ha)	Production (ton)	
Paddy - Maha	91	4.15	378	80	5.0	400	22
- Yala	19	3.56	66	40	5.0	200	134
OFC							
Maha - Pulses	-	-	-	3	1.5	5	5
- Chili	-	-	-	3	1.5	5	5
- Red onion	-	-	-	2	15.0	30	30
- Vegetables	-	-	-	1	10.0	10	10
Yala - Sesame	1	0.37	*	2	0.9	2	2
- Pulses	-	-	-	3	1.5	5	5
- Chili	1	0.39	*	3	1.5	5	5
- B ^o onion	-	-	-	2	10.0	20	20
- Vegetables	2	2.68	5	1	10.0	10	5

*: Negligible amount

2) Strengthening Agricultural Extension Services

The proposed technical improvement required for promoting OFC cultivation in Periyakulama is as follows.

a) Group cultivation of OFC.	d) Improvement of cultivation technique.
b) Introduction of appropriate cultivation technique.	e) Procurement of OFC seeds.
c) Selection of suitable crops	f) Improvement of OFC marketing.

PDOA of the North Central Province is to conduct the following extension

activities in order to achieve promotion of OFC cultivation. The group cultivation in OFC is to be educated through FOs and the improvement of OFC marketing system is to be described in Section 3).

Agriculture Extension Activity – Periyakulama Medium Scheme

Programme	Objectives	Method & Required Materials
1) Field Trial / Demonstration Programme - Adaptive trials - Small-scale demonstration - Cropping pattern demonstration - Large-scale demonstration - Productivity increase programme - IPM programme	- To develop technology for improve productivity - To demonstrate recommended practices of paddy and OFC for crop diversification and increase productivity.	<ul style="list-style-type: none"> ● Conducted by the extension staff of PDOA of the NC province. FOs take close contact with PDOA. ● Use farmers' field for demonstration ● Farmer training programme including quality seed campaign, field tour ● Seed production programme include provision of register seed and technical guidance. Production expense is born by farmers. ● Required material cost for extension activities are born by the Project. Details are shown in 1/12 to 7/12 of Table R.3.2 of Appendix-R.
2) Farmer Training Programme - Induction farmer training - Induction farmer guidance - Farmer training - Workshop, quality seed campaign, study tour	- To disseminate crop diversification and cultivation technique directly to farmers.	
DOA is carrying on seed production programme in the scheme, therefore the Project is not include it.		

3) Improvement of Marketing of Agricultural Outputs and Inputs Materials

Improvement of inputs materials

Co-operative purchasing of input materials is proposed by FOs. This system is to carry out by linking to a group loan mentioned in the improvement of rural credit of the item 4). Awareness and education to Tirappane ASC is to attempt for introducing the system.

Improvement of outputs

Following improvement of marketing programme is proposed. These activities are to be carried out by FOs (FO business subcommittee).

Improvement Programme of Marketing Agricultural Products – Periyakulama Medium Scheme

Programme	Objectives	Method & Required Materials
1) Setting Pola	- To activate marketing of farm products by open Polas. - To sell small quantity products from home gardens.	<ul style="list-style-type: none"> ● Polas are managed by FOs. Proposed that Pola is to set without any construction and no fee for Pola is to be charged. ● Guidance for setting Pola is to be carried out to FOs by Tirappane ASC/DAS and suitable location and day are to be decided by contact with merchants. ● Proposed location of Polas are shown in the Project layout map based on the discussion with FO leaders.
2) Setting Collecting Point of Farm Products	- To set contact points of producers with merchants on outputs marketing.	<ul style="list-style-type: none"> ● No materials are required for setting the system. ● Selections of merchants and locations are determined by farmers and Proceeded by FOs.
3) Establishing Co-operative Shipping System	- To sell products regularly and develop new markets.	<ul style="list-style-type: none"> ● ASC/DAS is provide guidance to both merchants and FOs on collecting points and co-operative selling.

(continued)

4) Establishing of Market Information Collection	- To collect information on market prices.	<ul style="list-style-type: none"> ● Regular purchasing of KARTI publication. PMU will provide information on purchasing.
5) Improving Quality	- To improve quality of products.	<ul style="list-style-type: none"> ● No materials are required. ● Quality standard of products is not established and it is judged by merchants. FOs have to collect information of quality and disseminate to farmers. ● Tirappane ASC/DAS is to provide guidance on information collection.

4) Improvement of Rural Credit

For the improvement of rural credits, introduction of the following loans is proposed.

Improvement of Rural Credit – Periyakulama Medium Scheme

Programme	Objectives	Method & Required Materials
1) Introduction of Group Loan (cultivation loan)	<ul style="list-style-type: none"> - For purchasing inputs materials. - Linkage with co-operative purchasing system. 	<ul style="list-style-type: none"> ● No required materials. ● Mainly loan by private banks. It is considered to be possible to introduce for group loan by private banks, because this loan is practised at present. PMU is to request to banks on introduction. ● The system management/operation of farmer sides is carried out by FOs(subcommittee) ● Tirappane ASC/DAS is to educate FOs on the introduction and training FO leaders on the operation works.
2) Introduction of Revolving Loan (medium term loan)	For purchasing farm machinery and financing small-scale enterprise.	<ul style="list-style-type: none"> ● No required materials. ● Periyakulama FO is operating at present. The Project is to strengthen the existing system. Principally the fund is to be prepared by FOs. If its capital is not enough, FOs obtain a loan from bank, and PMU supports FOs. ● Tirappane ASC/DAS is to provide training for lending works.
3) Introduction of Mutual Aid Credit system	For emergency need on living as sickness, accident or financing of self-employment.	<ul style="list-style-type: none"> ● No required materials. ● Loan from the Women's Bank. ● Mainly operating for women groups. FOs (Income Generation/ Social Services Subcommittee) is deal with education but not on operation. ● Tirappane ASC/DAS's education to FOs.

5) Promotion of reforestation in the catchment area

Planting of fruit trees such as mango and jackfruit is to be promoted for the environment conservation in the upper part of tank of the catchment area. The agriculture subcommittee of the FO is to carry out these fruits cultivation and PDOA is to provide technical guidance and seedlings.

6) Establishment of watch and protection system of wild elephant

It is proposed to set several observation points in the elephant infested area and to organise a watching and protecting system among the community members. The agriculture subcommittee of the FO is to operate and manage the system and the FO is to be equipped with thunder-flashes and crackers.

Project Design Matrix - Periyakulama Medium Irrigation Scheme

Name of Project : Periyakulama Development Project for Irrigated Agriculture and the Community

Project Area : Periyakulama Medium Irrigation Scheme

Duration : 5 years

Date : 31 May 2000

Executing Agency : Ministry of Irrigation and Power (MIP)

Target Group : Farmers / all villagers in the Periyakulama Scheme

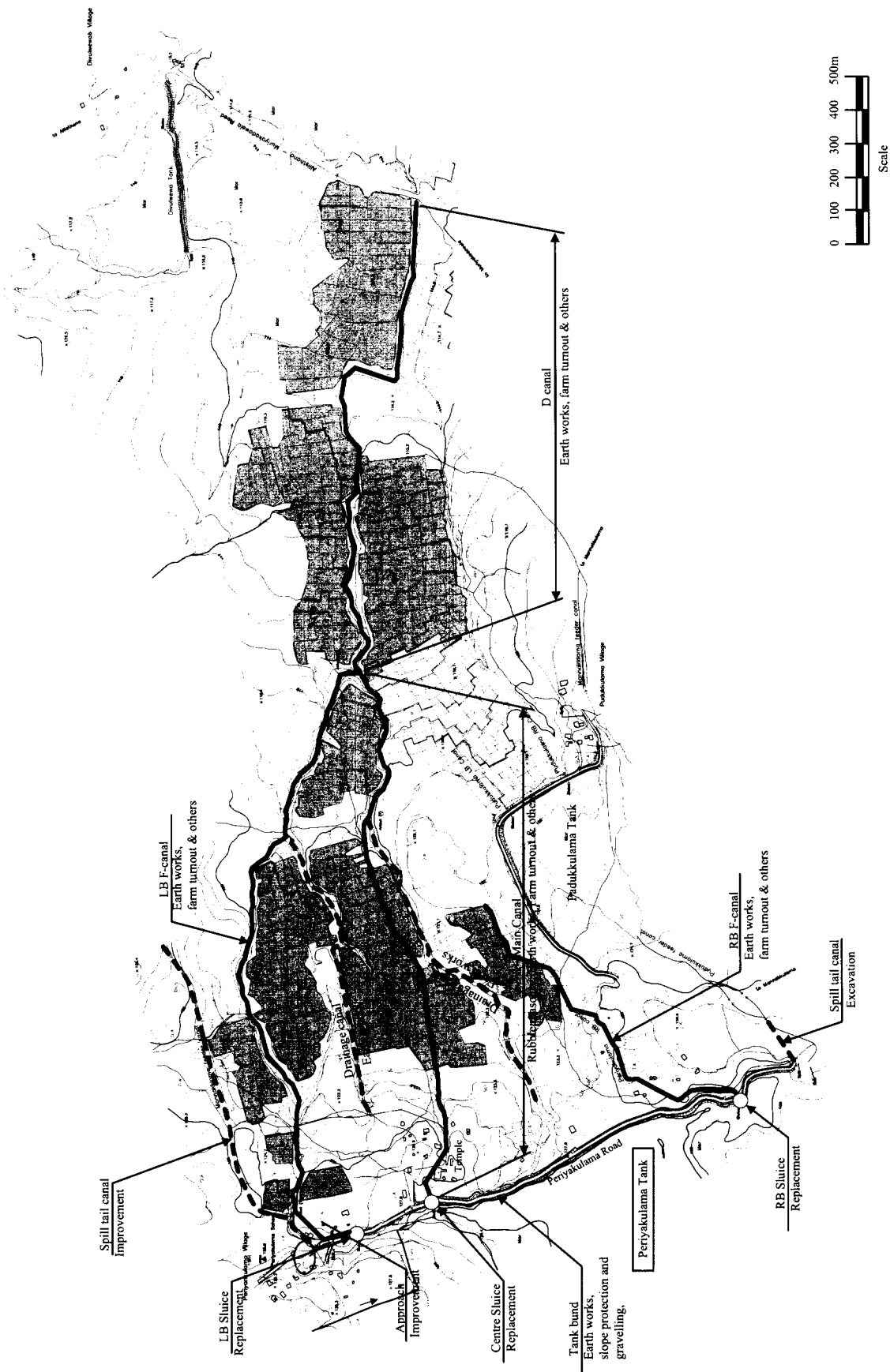
Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
1.1 Achieving sustainable development of regional agriculture	1.1 Development activities are planned and implemented independently by FO and farmers themselves.	1.1 Monitoring reports of the project office (PMU)	Agricultural policy of the Government not hinder implementation of the project.
1.2 Improving agricultural productivity of the rural community	1.2 Agriculture is economically feasible.	1.2 Monitoring reports of PMU	
Project Purpose			Agricultural products do not have to face unreasonable competition from imported products.
2.1 Economic status of farmer community is brought up.	2.1 Total gross income of farmers increase progressively by the end of the project.	2.1 Monitoring reports of PMU	
Outputs			There is no extreme natural disaster (drought, heavy rain, etc.). Government enforces existing rules and regulations to protect environment. Other sectors have no drastic and sudden change in the economic activities. Social conditions in the community have no drastic change. The project has no adverse effect from the other development projects, even if they overlapped.
3.1 FO having multi functions relating to irrigation, agriculture, small enterprises, income generations, social services is established and activated.	3.1.1 FO provides various services including income generation, etc. from the 3rd year after commencement of the project.	3.1.1 Minutes of FO's general meeting and monitoring reports of PMU	
	3.1.2 Committee and sub-committee meetings are held monthly by the 3rd year after commencement of the project.	3.1.2 Minutes of FO's committee and sub-committee meetings	
3.2 Irrigation water is properly supplied in accordance with a schedule.	3.2 Farmers are able to receive water in accordance with a schedule by the end of the project.	3.2 Monitoring reports of PMU	
3.2.1 Irrigation facilities are rehabilitated and improved.	3.2.1 Facilities necessary for proper water supply are repaired and improved by the 3rd year after the commencement of the project.	3.2.1 Monitoring reports of PMU	
3.2.2 Proper water management is done by FO.	3.2.2 Discharge is observed by FO after completion of construction works.	3.2.2 Records of FO	
3.2.3 Irrigation facilities are maintained.	3.2.3 All facilities are maintained by FO after completion of construction works.	3.2.3 Monitoring reports of PMU and minutes of FO's general meeting	
3.3 Agricultural activities are improved.	3.3 Agricultural productivity of farmers is improved from the 3rd year after completion of the construction works.	3.3 Animator's field survey reports and records of ASC (AI)	
3.3.1 OFC cultivation is expanded.	3.3.1 Extent of OFC occupies about 20% of paddy area in Yala by the end of the project.	3.3.1 Animator's field survey reports	
3.3.2 Agricultural extension services are strengthened.	3.3.2 Yields of crops reach the level of "projected yields" by the 3rd year after completion of construction works.	3.3.2 Animator's field survey reports	
3.3.3 Marketing of farm inputs and outputs is improved.	3.3.3 (1) Group purchasing of farm inputs is implemented actively by the 3rd year after commencement of the project.	3.3.3 (1) FO's account books and financial reports in FO's general meeting	
	3.3.3 (2) Products are sold directly by farmers to markets from the 3rd year after commencement of the project.	3.3.3 (2) Monitoring reports of PMU	
3.3.4 Access to credit services is improved.	3.3.4 Group loan, revolving loan and multi-aid credit systems are established by the 3rd year after commencement of the project.	3.3.4 Reports of Banks, monitoring reports of PMU	
3.3.5 Deforestation in the catchment area is reduced.	3.3.5 FO/farmers start planting of tree crops in the catchment area from the 3rd year after commencement of the project.	3.3.5 Animator's field survey reports	
3.3.6 Damage by elephant is decreased.	3.3.6 Surveillance system of wild elephant is established in FO by 2nd year after commencement of the project.	3.3.6 Animators' field survey reports	
Activities	Inputs		Trained Officers stay with the project. Local government and front line officers positively support the project. No action will be taken by government to destabilize local market.
4.1 Strengthening FO.	Foreign Donor	Sri Lankan Side	
4.1.1 Implement awareness and training programmes.	Mobilization	(1) Sri Lankan Government	Pre-conditions The Sri Lankan Government raises all project funds including foreign currency portion, local currency portion and recurrent cost of PMU. MIP and agencies concerned establishes organization to implement project. To operate the project, necessary officers and physical facilities are provided by MIP and agencies concerned.
4.1.2 Reorganize FOs to have multi function.	Awareness and training costs	Manpower	
4.1.3 Implement income generation and social services through FOs.	Rehabilitation and improvement cost	- Local engineers/experts	
4.1.4 Construct Farmer Centre.	Equipment - Vehicles	- Administrative officers	
	- O&M equipment	- Supporting staff	
4.2 Supplying irrigation water in accordance with schedule.	Facilities - Agri. extension	Facilities of PMU	
4.2.1 Rehabilitate and improve irrigation facilities.	- Facilities for	Recurrent cost for project	
4.2.2 Improve water management.	agri. extension	implementation	
4.2.3 Strengthen O&M of irrigation facilities.	- Farmer centers	(2) Farmers	
4.3 Improving agricultural activities.	Monitoring cost	10% of rehabilitation and improve-	
4.3.1 Promote OFC cultivation.	Cost for engineering services	ment cost of all irrigation facilities	
4.3.2 Strengthen agricultural extension services.	Physical contingency	(3) NGO for implementing awareness and	
4.3.3 Improve marketing of farm inputs and outputs.	Price contingency	training programmes	
4.3.4 Improve access to credit services.			
4.3.5 Promote reforestation in the catchment area.			
4.3.6 Establish surveillance system of wild elephant in FO.			
		Total Project Cost	

Plan of Operation - Periyakulama Medium Irrigation Scheme (1/2)

Activities	Expected Results	Schedule (Year)								Agencies in Charge	Inputs	Remarks
		1st	2nd	3rd	4th	5th	6th	7th	8th			
1. Mobilization of PMU												
2. Awareness programme: Officers of agencies concerned												
4.1 Strengthening farmers' organisation.												
4.1.1 Implement awareness and training programme	Level-up farmers' and community people's knowledge for FO.									- PMU (KARTI)	- Trainers, moderators	- Providing training programme for participatory planning
1) Awareness programme										- ASC/DAS, IMD	- DO/ASC, Farmer Animator	- A Community Coordinating Committee (CCC) is established in each community.
2) Training to FO's leaders for operation and management of FO	Development component is implemented independently by FO/farmers.										- Organizational expert (IMD)	
4.1.2 Reorganize FO to have multi function.	FO is strengthened by rising in social standing through providing various services to the community.									- ASC/DAS, IMD	DO/ASC, Farmer Animator	- Re-organization is decided by the community's general meeting.
1) Establishing organization of multi-function										- ASC/DAS, IMD	Organizational expert (IMD)	Providing necessary guidance and information for re-organization
2) Guidance for preparing articles & by-laws for organization of multi-function												
4.1.3 Implement income generation and social services through FO.	Increasing farmers' income											
1) Home garden development										- PDOA (NCP)	- Extension officers	- Income generating activities are implemented independently by FO.
2) Livestock development										- PDAPH	- Extension officers	
3) Inland fisheries development										- NAQDA	- Extension officers	- FO establishes a "Sub-committee for Income Generation and Social Services" for dealing income generating activities.
4) Vocational training										- NAITA, NYSC	- Instructor	
5) Employment information services										- NYSC	- Instructor	
6) Small enterprises and business										- SEDD/MYASRI	- Instructor	
7) Providing social services										- ASC/DAS	- DO/ASC, Farmer Animator	
8) Credit services for income generation										- ASC/DAS	- DO/ASC, Farmer Animator	
4.1.4 Construct Farmer Centres.	Keep efficient management of FO and close communication between FO and agencies concerned or within communities.									- ASC/DAS, IMD	- Farmer centre x 1 no.	- Multi-purpose center with office room for FO & Animator, meeting places and temporary store space of farm inputs for cooperative purchasing
4.2 Supplying irrigation water in accordance with schedule.												
4.2.1 Rehabilitate and improve irrigation facilities.												
1) Investigation, detailed design & tendering (including training for farmers and staff)	Farmers participation to formulate the plan can be promoted.									- ID, IMD	- Staff in ID & IMD, farmers	- Canal structures to be rehabilitated (regulators, turnouts, measuring devices, etc)
2) Implementation of rehabilitation / improvement	Proper water management and O&M can be achieved.									- ID	- Staff in ID (Contractors), farmers	- Rehabilitation of F-canals are carried out by farmers.
3) Turnover process of facilities (including training for farmers and staff)	Irrigation facilities can be handed over in proper condition.									- ID, IMD	- Staff in ID & IMD, contractors and farmers	
4.2.2 Improve water management.												
1) Training for the government staff	Capacity of the staff for water management is improved.									- ID, IMD	ID and external staff	- ID is responsible for water management of main irrigation facilities.
- Awareness for water management											Vehicles and equipment	
- Irrigation planning and scheduling											Training facilities	
- Water distribution and monitoring											Training equipment	
2) Training for farmers	Proper water management is done by the farmers (FO).									- ID, IMD	IMD, ID and external staff	- Farmers are responsible for water management below D-canals.
- Awareness for water management											Vehicles and equipment	
- Irrigation planning and scheduling											Training facilities	
- Water distribution and monitoring											Training equipment	
4.2.3 Strengthen O&M of irrigation facilities.												
1) Training for the government staff	Capacity of the staff for O&M is improved.									- ID, IMD	ID and external staff	- ID is responsible for O&M of main irrigation facilities.
- Awareness programme for O&M											Vehicles and equipment	
- Irrigation planning and scheduling											Training facilities	
- Water distribution and monitoring											Training equipment	

Plan of Operation - Periyakulama Medium Irrigation Scheme (2/2)

Activities	Expected Results	Schedule (Year)								Agencies in Charge	Inputs	Remarks
		1st	2nd	3rd	4th	5th	6th	7th	8th			
2) Training for farmers - Awareness programme for O&M - Irrigation planning and scheduling - Water distribution and monitoring	- Farmers can manage the irrigation facilities by themselves.									- ID, IMD	IMD, ID and external staff Vehicles and equipment Training facilities Training equipment	- Farmers are responsible for O&M of facilities below D-canals.
4.3 Improving agricultural activities.												
4.3.1 Promote OFC cultivation.	- Extent OFC occupies about 20% of paddy area in Yala.									- PDOA (NCP)	PDOA (NCP), Farmer Animator, etc.	- Promoting activities are done independently by FO, and PDOA (NCP) provide information and guidance to them.
4.3.2 Strengthen agricultural extension services.												
1) Field programs - Adaptive trials - Small-scale demonstration - Cropping pattern demonstration - Large-scale demonstration - Productivity increase programme - IPM	- Level-up farmers' knowledge for crop diversification and proper farming practices of crop									} PDOA (NCP)	} PDOA (NCP), DOA, Farmer Animator, etc.	} Demonstration, trial, IPM etc. Necessary cost is funded by the Project.
2) Farmer training programmes - Induction farmer training - Induction farmer guidance - Field day - Workshop/mass guidance - Seed campaign - Study tour	- Improve farmers' technique for crop cultivation											
4.3.3 Improve marketing of farm inputs and outputs.												
1) Improve marketing of farm inputs - Establishing group purchasing system of farm inputs	- The farmers can purchase adequate quantity of farm inputs before the season.									- IMD, ASC	- DO/ASC, PDOA (NCP), Institutional Officer/IMD, Animator	- Group purchasing system is linked with agricultural extension and group loan.
2) Improve marketing of farm outputs - Establishing pola - Establishing collecting point of farm products - Establishing cooperative shipping - Establishing marketing information service - Improving quality of products	- Improve access to market for selling products.									- ASC/DAS - ASC/DAS - ASC/DAS - PMU - ASC/DAS	- No facilities - No facilities - No facilities - Bulletin of KARTI - No facilities	} Improving activities are done independently by FO, and ASC/DAS provide information and guidance to them.
4.3.4 Improve access to credit services. - Introducing group loan system (cultivation loan) - Introducing revolving loan system (medium term credit) - Promoting multi aid credit	- Improve access to credits for purchasing farm inputs, agri. equipment and capital of income generating activities.									- PMU, banks & DAS - PMU, DAS - ASC/DAS	- Loaned by private banks - FO's owned capital or arranged by PMU.	
4.3.5 Promote reforestation in the catchment area.	- Deforestation in the catchment area is reduced.									- PDOA (NCP), ASC/DAS	- Seedlings	- Group loan is provided through FO, and invested to purchase farm inputs. - Loan for procurement of machinery & farm facility, and for capital of small enterprises - Loans for living and income generation and managed by women's group.
4.3.6 Establish surveillance system of wild elephant in FOs.	- Damage by elephant is decreased.									- ASC/DAS		- FO promotes planting of tree crops in catchment area.
(Follow-up programme)										- IMD, DAS		



Development Plan of Periyakulama Medium Scheme

17.3.4 Mahananneriya Medium Scheme

(1) General

Mahananneriya medium scheme is located in the midpoint of Anuradhapura and Kurunegala. Palukadawela major scheme is located in the upper stream. The total number of farm households of Mahananneriya scheme is 510 and the irrigated paddy area is 158 ha. There is one Farmers' organisation organised in the scheme and it is presented in Table 15.1.1.

The PDM of Mahananneriya scheme is shown on page 17-47. The development plan is formulated as "Economical status of the rural community is improved" for the Project purpose and the target group is farmer/community. The details are given in the table on the Plan of Operation of page 17-48 and the Project layout map on page 17-50. The summary of the plan of the scheme is as follows.

(2) Strengthening Farmers' Organisation

The concrete plans for the strengthening FO programmes are as follows.

1) Awareness Programme and Educational/Training Programmes

Awareness programme

Awareness programme is applied for the both "Farmers" and "Official Institutions" as mentioned before. Its contents and implementation procedure are as detailed in Section 9.2. The multifunctional FO is to be established through this programme with the self-motivation of the entire community.

The leader of Mahananneriya scheme was the former Vel Vidana (irrigation headman). The FO of the scheme is organised by the aged people, generally conservative toward the FO's activities and also women do not actively participate. Therefore, the guidance, such as such women to be assigned as leaders is needed during the awareness programme.

Education/ training programme

Following education and training programmes for fostering leaders of the multifunctional FO are to be conducted.

Education/Training Programmes for FO Leader – Mahananneriya Medium Scheme

Training Subject	Contents	Training Method
1) Draft preparation of the Articles of Organisation amendment	Draft preparation of the Articles of Organisation and knowledge of the systems and the procedures required on the process.	Lecture in Mahananneriya Agrarian Service Centre (ASC/DAS) and practical training by Farmer Animator.
2) Practical training the basic operation and management of the organisation	Planning, participatory management, practical operation & management of FO, practical financial management, financial resource management, role & systems of Official concerned, etc.	

(continued)

3) Training on the income generation activity	Practical; training of the operation/management of Rural Credit (Group-loan, Revolving-loan) and co-operative purchasing/selling.	Lecture by ASC/DA, IMD, private bank (PMU arranges with banks) & practical training by Farmer Animator.
4) Information network formation/Awareness training	Establishing information networks with external organisations for collecting and sharing information in and around the community.	Holding joint workshops with external organisations and the FO for sharing information.

These programmes are to be conducted separately from the Awareness programme within the regular works of Mahananneriya ASC. Education and training facilities of Mahananneriya ASC are to be improved and strengthened (refer to Chapter 17.4).

2) Establishment of Multifunctional Farmers' Organisation

The present FOs is to be reorganised to be multifunctional. The reorganisation is determined in the general meeting of the entire community, which conducted the awareness programme mentioned previously. The organisation is to provide various services to farmer/community and to be fostered as an autonomous organ representing the community. Major change in the reorganisation is to set subcommittees under the executive committee and to act on irrigation, agriculture, business of FO, and income generation/social services.

Setting up the Subcommittee – Mahananneriya Medium Scheme

Subcommittees	Purposes and Activities
1) Irrigation	i) Water management, ii) O&M of facilities, iii) Safety operation of irrigation facility, iv) Estimation & collection of Irrigation Service Fee (ISF), and v) Survey on lease/tenant of farmland
2) Agriculture	i) Collaboration with official extension works, ii) Holding technical extension seminar, iii) income generation activity (Home garden and livestock development), iv) Operation of group works as pest control, v) Reforestation in the catchment area (planting of fruit trees), and vi) Control elephant damage (strengthening control by FO).
3) Businesses of FO	i) Establishment and operation of co-operation purchasing/selling, Pola/collection point, ii) Operation and management of the rural credit service (group loan, revolving loan), iii) Business of FO as farm machinery rental service, inland fishery, agro-processing, etc.
4) Income generation/ Social Services	i) Income generation activities such as vocational training, small-scale enterprise/business, self-employment, ornamental fish culture and collection of employment information, ii) Promotion of mutual aid credit system, iii) Financial support for income generation, and iv) Promotion of anti alcohol addict campaign, social welfare, health & sanitary improvement.

An audit section is proposed to be set for maintaining transparency of FO activities and to employ volunteers for close communication with FO members. The audit section is to check periodically and report to the general meeting. The volunteers are to work on communication among the executive committee, the subcommittee, and the members.

3) Income Generation/Social Services through Farmers' Organisations

The subcommittees of "Agriculture" and "Income Generation/Social Services" are to carrying out income generation activities for farmers and community. The income generation/social services are to be carried out by the self-motivation of FOs and are targeting poverty groups in the community. Necessary information is to be provided through Mahananneriya ASC and Farmer Animators. The training facilities of NYSC are to be utilised for vocational training, so that no extra facility is constructed by the Project.

4) Construction of Farmer Centre

There is no facility for FO in Mahananneriya scheme. Farmer centre is to be constructed for offices of FO and Farmer Animator. The operation and management is to be carried out by the FO and the details are described in Section 17.4.2.

(3) Distribution of Proper Irrigation Water

1) Rehabilitation and Improvement Plan of Irrigation Facilities

The rehabilitation and improvement works in Mahananneriya medium scheme are as follows:

Rehabilitation and Improvement Plan for Mahananneriya Medium Scheme

Category	Item	Quantity	Description of works
Tanks	Bund	L.S.	Earth filling, Gravelling, Rip-rap, Filter,
	Sluice	L.S.	Minor repair, Downstream protection, Measuring device
	Spillway	L.S.	Concrete repair works
Main canal	Earthworks	3,500 m	Earth filling, De-silting
	Lining	90 m	Masonry Lining
	Structures	60 Nos.	Turnout, Regulator, Drop, Culvert etc.
	O&M Road	2,300 m	Earth filling, Gravelling, Culvert
Others	Anicuts	7 Nos.	Improvement of Anicuts

Major rehabilitation works of Mahananneriya medium scheme are tank, main canal and O&M of road; however, the rehabilitation of F-canals is not included.

The works for tank are to be carried out by constructors and the works for main canal is to be carried out by either contractors or farmers. The training courses for rehabilitation and improvement works are programmed in order to reflect farmers' intention to the works properly and to smoothly carry out the works by themselves. The table below shows the training course for the government staff and the farmers.

**Training Programme for Rehabilitation and Improvement Works
– Mahananneriya Medium Scheme**

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1 day, pre-construction	RATPA	Participatory planning, communication with farmers
	Second	1 day, in the construction	ID	Skill of technology transfer to farmers
	Third	1 day, post-construction	ID	Hand-over of O&M responsibility to farmers, follow-up programme
Training for farmers	First	2 days, pre-construction	RATPA	Participatory planning Field investigation, design and cost estimate
	Second	1 day, pre-construction	ID	Contract for rehabilitation works, farmers' contribution
	Third	2 days, in the construction	ID	Quality control for earthworks and concrete, preparation of document for rehabilitation, field inspection
	Fourth	1 day, post-construction	ID	Follow-up programme

RATPA: Research and Advisory Team for Participatory Approach

Education/training for officers is one course for TA and WS of Galgamuwa ID. One course is to be conducted for farmers, the office bearers of FOs and the subcommittee members.

2) Training for Water Management

The training on water management for the government staff and farmers is proposed as follows:

Training Programme for Water Management – Mahananneriya Medium Scheme

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1 day, pre-construction	RATPA	Awareness programme, communication with farmers
	Second	1.5 days, post-construction	ID	Estimation of water requirement, preparation of water distribution programme, skill for gate operation of tank and off-takes, flow measurement and flow monitoring, skill of technology transfer to farmers
	Third	1 day	ID	Follow-up programme
Training for farmers	First	1 day, pre-construction	RATPA	Awareness programme, communication with government staff, communication among farmers, communication with other FOs
	Second	1.5 days, post-construction	ID	Preparation of water distribution programme, skill for gate operation of tank and off-takes
	Third	1 day	ID	Follow-up programme

RATPA: Research and Advisory Team for Participatory Approach

Education/training for officers is one course for TA and WS of Galgamuwa ID. One course is to be conducted for farmers, the office bearers of FOs

and the subcommittee members. The gate operation method for newly constructed canal structures is required to train them well. After completion of the rehabilitation works, the management of all facilities is to be transferred to the FOs. The major objective of the training for officers is to improve capability to provide technical guidance to farmers.

3) Training for O&M of Irrigation Facilities

The training on O&M of irrigation facilities for the government staff and farmers is proposed as follows:

Training Programme for O&M– Mahananneriya Medium Scheme

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1 day, pre-construction	RATPA	Awareness programme, communication with farmers
	Second	1.5days during the construction	ID	Preparation of maintenance programme, monitoring of maintenance activities, skill of technology transfer to farmers
	Third	1 day	ID	Follow-up programme
Training for farmers	First	1 day, pre-construction	RATPA	Awareness programme
	Second	1.5days during the construction	ID	Preparation of maintenance programme, organising a patrol, organising a Sramadana, collection of O&M charge
	Third	1 day	ID	Follow-up programme

RATA: Research and Advisory Team for Participatory Approach

Education/training for officers is one course for TA and WS of Galgamuwa ID. One course is to be conducted for farmers, the office bearers of FOs and the subcommittee members. Training on the method of technology transfer of O&M to farmers is to be conducted for officers.

(4) Improvement of Agriculture Activities

1) Promotion of OFC Cultivation

The results of PCM workshop show the increase paddy productivity as well as the promotion of OFC cultivation. However, water resource potential of Mahananneriya scheme and its potential for increasing cultivation area after the project implementation is high (refer Section 9.4.3). Traditionally farmer practises paddy cultivation when water is available in the field. Therefore Paddy strengthening cropping pattern is proposed and also the increase of OFC cultivation in Yala. The proposed cultivation area and production of respective crop are as follows, and the proposed cropping system is presented in Figure15.3.1

**Cropping Area and Production With & Without Project
– Mahananneriya Medium Scheme**

	Without Project			With Project			Increase (ton)
	Area (ha)	Yield (ton/ha)	Production (ton)	Area (ha)	Yield (ton/ha)	Production (ton)	
Paddy - Maha	158	2.71	428	158	5.0	790	362
- Yala	-	-	-	140	5.0	700	700
OFC							
Yala - Sesame	-	-	-	3	0.9	3	3
- Pulses	1	0.49	*	4	1.5	6	6
- Chili	2	1.71	3	4	1.5	6	3
- B'onion	-	-	-	3	10.0	30	30
- Vegetables	-	-	-	2	10.0	20	20

2) Strengthening Agricultural Extension Services

Major technical improvement required for promoting OFC cultivation and increasing paddy productivity in Mahananneriya scheme are as follows.

OFC Promotion	Increase Paddy Productivity
<ul style="list-style-type: none"> - Introduction of group cultivation of OFC. - Introduction of appropriate cultivation technique. - Collection of market information. - Improvement of cultivation technique. - Preparation of OFC seed. - Improvement of rural credit. - Improvement of OFC marketing system. 	<ul style="list-style-type: none"> - Introduction of appropriate cultivation technique. - Dissemination of quality seed. - Dissemination of appropriate seed rate & plant density. - Straight fertiliser & organic material use. - Practice of IPM. - Effective labour use.

Provincial Department of Agriculture (PDOA) of North-western province is to conduct the following extension activities. Agriculture subcommittee of the FO is to carry out education activity for group cultivation. Improvement of marketing inputs materials and the rural credit are mentioned in Sections 3) and 4).

Agriculture Extension Activity – Mahananneriya Medium Scheme

Programme	Objectives	Method & Required Materials
1) Field Trial / Demonstration Programme <ul style="list-style-type: none"> - Adaptive trials - Small-scale demonstration - Cropping pattern demonstration - Large-scale demonstration - Productivity increase programme - IPM programme 	<ul style="list-style-type: none"> - To develop technology for improving productivity - To demonstrate recommended practices & irrigation technique on OFC promotion & paddy productivity increase. - Appropriate chemical application 	<ul style="list-style-type: none"> ● Conducted by PDOA of North western province. ● FOs closely contact with PDOA ● Use farmers' field for demonstration ● Farmer training programme including quality seed campaign, and field tour ● Seed production programme includes provision of register seed and technical guidance. Production expense is born by farmers. ● Required material cost for extension activities are born by the Project. Details are shown in Tables R 3.2-1/12 to 7/12 of Appendix-R.
2) Farmer Training Programme <ul style="list-style-type: none"> - Induction farmer training - Induction farmer guidance - Farmer training - Workshop - Quality seed campaign - Study tour 	<ul style="list-style-type: none"> - To disseminate cultivation technique directly to farmers. 	
3) Seed Production Programme <ul style="list-style-type: none"> - Paddy seed production - OFC seed production 	<ul style="list-style-type: none"> - To foster seed production farmers. 	

3) Improvement of Marketing of Agricultural Outputs and Inputs Materials

Improvement of inputs materials

Co-operative purchasing of input materials by FOs is proposed. This system is to carry out by linking to the group loan mentioned in the improvement of rural credit of item 4). Awareness and education to Mahananneriya ASC is to attempt for introducing the system.

Improvement of outputs

Following marketing improvement programme is proposed. These activities are to be carried out by FOs (business subcommittee).

Improvement Programme of Marketing Agricultural Products – Mahananneriya Medium Scheme

Programme	Objectives	Method & Required Materials
1) Setting Pola	To activate marketing of farm products by open Polas. To sell small quantity products from home gardens.	<ul style="list-style-type: none"> ● Polas are managed by FOs ● Proposed that Pola is to set without any construction for reducing maintenance cost and no Pola fee is to charge. ● Guidance for setting Pola is to be carried out to FOs by Mahananneriya ASC/DAS and suitable location and day are to be decided by contact with merchants. ● Proposed location of Polas are shown in the Project layout map based on the discussion with FO leaders.
2) Setting Collecting Point of Farm Products	To set contact points of producers with merchants on outputs marketing.	<ul style="list-style-type: none"> ● No required materials for setting the system. ● Selections of merchants and locations are determined by farmers and Proceeded by FOs
3) Establishing Co-operative Shipping System	To sell products regularly and develop new markets.	<ul style="list-style-type: none"> ● ASC/DAS is to provide guidance to both merchants and FOs on collecting points and co-operative selling.
4) Establishing of Market Information Collection	To collect information on market prices.	<ul style="list-style-type: none"> ● Regular purchasing of KARTI publication. PMU will provide information on purchasing.
5) Improving Quality	To improve quality of products.	<ul style="list-style-type: none"> ● No required materials. ● Quality standard of products is not established and it is judged by merchants. FOs have to collect information on quality and disseminate to farmers. ● ASC/DAS is to provide guidance on information collection.

4) Improvement of Rural Credit

For the improvement of rural credit, introduction of the following loans is proposed to the Mahananneriya Medium Scheme.

Improvement of Rural Credit – Mahananneriya Medium Scheme

Programme	Objectives	Method & Required Materials
1) Introduction of Group Loan (cultivation loan)	For purchasing inputs materials. Linkage with co-operative purchasing system.	<ul style="list-style-type: none"> ● No required materials. ● Mainly loan by private banks. It is considered to be possible to introduce for group loan by private banks, because this loan is practised at present. PMU is to request to banks on introduction. ● The system management/operation of farmer sides is carried out by FOs (subcommittee) ● Mahananneriya ASC/DAS is to educate FOs on the introduction and training FO leaders on the operation works.
2) Introduction of Revolving Loan (medium term loan)	For purchasing farm machinery and financing small-scale enterprise.	<ul style="list-style-type: none"> ● No required materials. ● Operation & management by FOs (subcommittees). Principally the fund is to be prepared by FOs. If its capital is insufficient, FOs obtain a loan from bank, and PMU provides support services to FOs. ● Galgamuwa ASC/DAS is to provide training for lending works.
3) Introduction of Mutual Aid Credit system	For emergency need on living as sickness, accident or financing of self-employment.	<ul style="list-style-type: none"> ● No required materials. ● Loan from the Women's Bank. ● Mainly operating for women groups. FOs (Income generation/ Social Services Subcommittee) is deal with education but not on operation. ● ASC/DAS's education to FOs.

5) Promotion of Reforestation in the Catchment Area

Planting of fruit trees such as mango and jackfruit is to be promoted for the environment conservation in the upper part of tank of the catchment area. The agriculture subcommittee of FO is to carry out these fruit cultivation and PDOA is to provide technical guidance and seedlings.

6) Establishment of Watch and Protection System of Wild Elephant

It is proposed to set several observation points in the elephant infested area and to organise the watching and protecting system among the community members. The agriculture subcommittee of FO is to operate and manage the system and the FO is to be equipped with thunder-flashes and crackers.

Project Design Matrix - Mahananneriya Medium Irrigation Scheme

Name of Project	: Mahananneriya Medium Scheme Development Project for Irrigated Agriculture and the Community	Duration	: 5 years	Date	: 31 May 2000
Project Area	: Mahananneriya Medium Irrigation Scheme	Target Group	: Farmers / all villagers in the Mahananneriya Scheme		
Executing Agency	: Ministry of Irrigation and Power (MIP)				

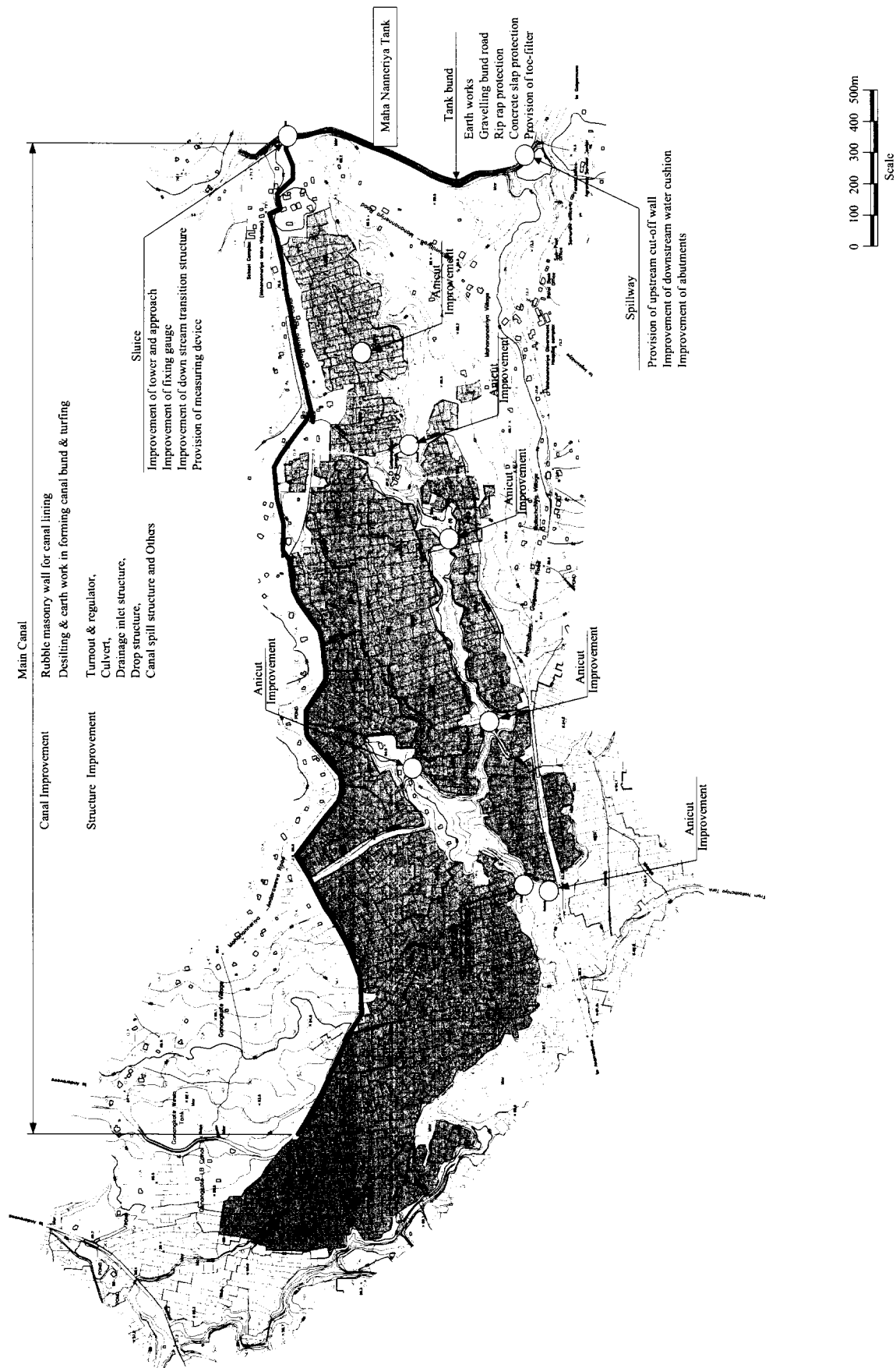
Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions (外部条件)
Overall Goal			
1.1 Achieving sustainable development of regional agriculture	1.1 Development activities are planned and implemented independently by FO and farmers themselves.	1.1 Monitoring reports of the project office (PMU)	Agricultural policy of the Government not hinder implementation of the project.
1.2 Improving agricultural productivity of the rural community	1.2 Agriculture is economically feasible.	1.2 Monitoring reports of PMU	
Project Purpose			Agricultural products do not have to face unreasonable competition from imported products.
2.1 Socio-economic status is improved.	2.1 Total gross income of farmers increase progressively by the end of the project.	2.1 Monitoring reports of PMU	
Outputs			There is no extreme natural disaster (drought, heavy rain, etc.). Government enforces existing rules and regulations to protect environment. Other sectors have no drastic and sudden change in the economic activities. Social conditions in the community have no drastic change. The project has no adverse effect from the other development projects, even if they overlapped.
3.1 FO having multi functions relating to irrigation, agriculture, small enterprises, income generations, social services is established and activated.	3.1.1 FO provides various services including income generation, etc. from the 3rd year after commencement of the project.	3.1.1 Minutes of FO's general meeting and monitoring reports of PMU	
3.2 Irrigation water is properly supplied in accordance with a schedule.	3.1.2 Committee and sub-committee meetings are held monthly by the 3rd year after the commencement.	3.1.2 Minutes of FO's committee and sub-committee meetings	
3.2.1 Irrigation facilities are rehabilitated and improved.	3.2 Farmers are able to receive water in accordance with a schedule by the end of the project.	3.2 Monitoring reports of PMU	
3.2.2 Proper water management is done by FO.	3.2.1 Facilities necessary for proper water supply are repaired and improved by the 3rd year after commencement of the project.	3.2.1 Monitoring reports of PMU	
3.2.3 Irrigation facilities are maintained.	3.2.2 Discharge is observed by FO after completion of construction works.	3.2.2 Records of FO	
3.3 Agricultural activities are improved.	3.2.3 All facilities are maintained by FO after completion of construction works.	3.2.3 Monitoring reports of PMU and minutes of FO's general meeting	
3.3.1 OFC cultivation is expanded.	3.3 Agricultural productivity of farmers is improved from the 3rd year after completion of construction works.	3.3 Animator's field survey reports and records of ASC (AI)	
3.3.2 Productivity of paddy is improved.	3.3.1 Extent of OFC occupies about 10% of paddy area in Yala by the end of the project.	3.3.1 Animator's field survey reports	
3.3.3 Marketing of farm inputs and outputs is improved.	3.3.2 Yield of paddy reaches the level of "projected yields" by the 3rd year after completion of construction works.	3.3.2 Animator's field survey reports	
3.3.4 Access to credit services is improved.	3.3.3 (1) Group purchasing of farm inputs is implemented actively by the 3rd year after commencement of the project.	3.3.3 (1) FO's account books and financial reports in FO's general meeting	
3.3.5 Deforestation in the catchment area is reduced.	3.3.3 (2) Quality control of OFC products are introduced by FO from 3rd year after commencement of the project.	3.3.3 (2) Monitoring reports of PMU	
3.3.6 Damage by elephant is decreased.	3.3.4 Group loan, revolving loan and multi-aid credit systems are established by the 3rd year after commencement of the project.	3.3.4 Reports of Banks, monitoring reports of PMU	
	3.3.5 FO/farmers start planting of tree crops in the catchment area from the 3rd year after commencement of the project.	3.3.5 Animator's field survey reports	
	3.3.6 Surveillance system of wild elephant is established in FO by 2nd year after commencement of the project.	3.3.6 Animators' field survey reports	
Activities	Inputs		Trained Officers stay with the project. Local government and front line officers positively support the project. No action will be taken by government to destabilize local market.
4.1 Strengthening FO.	Foreign Donor	Sri Lankan Side	Pre-conditions
4.1.1 Implement awareness and training programmes.	Mobilization	(1) Sri Lankan Government	The Sri Lankan Government raises all project funds including foreign currency portion, local currency portion and recurrent cost of PMU. MIP and agencies concerned establishes organization to implement project. To operate the project, necessary officers and physical facilities are provided by MIP and agencies concerned.
4.1.2 Reorganize FOs to have multi function.	Awareness and training costs	Manpower - Local engineers/experts	
4.1.3 Implement income generation and social services through FO.	Rehabilitation & improvement cost	- Administrative officers	
4.1.4 Construct Farmer Centre.	Equipment - Vehicles	- Supporting staff	
4.2 Supplying irrigation water in accordance with schedule.	- O&M equipment	Facilities of PMU	
4.2.1 Rehabilitate and improve irrigation facilities.	- Agri. extension	Recurrent cost for project implementation	
4.2.2 Improve water management.	Facilities	(2) Farmers	
4.2.3 Strengthen O&M of irrigation facilities.	- Facilities for agri. extension (including provincial seed farm of Galugamwa)	10% of rehabilitation and improvement cost of all irrigation facilities	
4.3 Improving agricultural activities.	- Farmer centers	(3) NGO for implementing awareness and training programmes	
4.3.1 Promote OFC cultivation.	Monitoring cost		
4.3.2 Strengthen agricultural extension services.	Cost for engineering services		
4.3.3 Improve marketing of farm inputs and outputs.	Physical contingency		
4.3.4 Improve access to credit services.	Price contingency		
4.3.5 Promote reforestation in the catchment area.			
4.3.6 Establish surveillance system of wild elephant in FO.		Total Project Cost	

Plan of Operation - Mahananneriya Medium Irrigation Scheme (1/2)

Activities	Expected Results	Schedule (Year)								Agencies in Charge	Inputs	Remarks
		1st	2nd	3rd	4th	5th	6th	7th	8th			
1. Mobilization of PMU		■										
2. Awareness programme: Officers of agencies concerned		■										
4.1 Strengthening farmers' organisation.												
4.1.1 Implement awareness and training programmes.	- Level-up farmers' and community people's knowledge for FO.		■							- PMU (KARTI)	- Trainers, moderators	- Providing training programme for participatory planning
1) Awareness programme			■							- ASC/DAS, IMD	- DO/ASC, Farmer Animator	- A Community Coordinating Committee (CCC) is established in each community.
2) Training to FO's leaders for operation and management of FO	- Development component is implemented independently by FO/farmers.		■								- Organizational expert (IMD)	- Re-organization is decided by the community's general meeting.
4.1.2 Reorganize FO to have multi function.	- FO is strengthened by rising in social standing through providing various services to the community.		■							- ASC/DAS, IMD	DO/ASC, Farmer Animator	Providing necessary guidance and information for re-organization
1) Establishing organization of multi-function			■							- ASC/DAS, IMD	Organizational expert (IMD)	
2) Guidance for preparing articles & by-laws for organization of multi-function			■									
4.1.3 Implement income generation and social services through FO.	- Increasing farmers' income											
1) Home garden development				■	■	■	■	■	■	- PDOA (NWP)	- Extension officers	- Income generating activities are implemented independently by FO.
2) Livestock development				■	■	■	■	■	■	- PDAPH	- Extension officers	- FO establishes a "Sub-committee for Income Generation and Social Services" for dealing income generating activities.
3) Inland fisheries development				■	■	■	■	■	■	- NAQDA	- Extension officers	
4) Vocational training				■	■	■	■	■	■	- NAITA, NYSC	- Instructor	
5) Employment information services				■	■	■	■	■	■	- NYSC	- Instructor	
6) Small enterprises and business				■	■	■	■	■	■	- SEDD/MYASRD	- Instructor	
7) Providing social services				■	■	■	■	■	■	- ASC/DAS	- DO/ASC, Farmer Animator	
8) Credit services for income generation				■	■	■	■	■	■	- ASC/DAS	- DO/ASC, Farmer Animator	
4.1.4 Construct Farmer Centre.	- Keep efficient management of FO and close communication between FO and agencies concerned or within communities.			■						- ASC/DAS, IMD	- Farmer centre x 1 no.	- Multi-purpose center with office room for FO & Animator, meeting places and temporary store space of farm inputs for cooperative purchasing
4.2 Supplying irrigation water in accordance with schedule.												
4.2.1 Rehabilitate and improve irrigation facilities.												
1) Investigation, detailed design & tendering (including training for farmers and staff)	- Farmers participation to formulate the plan can be promoted.		■							- ID, IMD	- Staff in ID & IMD, farmers	- Canal structures to be rehabilitated (regulators, turnouts, measuring devices, etc.)
2) Implementation of rehabilitation / improvement	- Proper water management and O&M can be achieved.			■	■					- ID	- Staff in ID (Contractors), farmers	- Rehabilitation of F-canals are carried out by farmers.
3) Turnover process of facilities (including training for farmers and staff)	- Irrigation facilities can be handed over in proper condition.				■	■				- ID, IMD	- Staff in ID & IMD, contractors and farmers	
4.2.2 Improve water management.												
1) Training for the government staff	- Capacity of the staff for water management is improved.		■							- ID, IMD	ID and external staff	- ID is responsible for water management of main irrigation facilities.
- Awareness for water management			■								Vehicles and equipment	
- Irrigation planning and scheduling				■	■						Training facilities	
- Water distribution and monitoring					■	■					Training equipment	
2) Training for farmers	- Proper water management is done by the farmers (FO).		■							- ID, IMD	IMD, ID and external staff	- Farmers are responsible for water management below D-canals.
- Awareness for water management			■								Vehicles and equipment	
- Irrigation planning and scheduling				■	■						Training facilities	
- Water distribution and monitoring					■	■					Training equipment	
4.2.3 Strengthen O&M of irrigation facilities.												
1) Training for the government staff	- Capacity of the staff for O&M is improved.		■							- ID, IMD	ID and external staff	- ID is responsible for O&M of main irrigation facilities.
- Awareness programme for O&M			■								Vehicles and equipment	
- Irrigation planning and scheduling				■	■						Training facilities	
- Water distribution and monitoring					■	■					Training equipment	

Plan of Operation - Mahananneriya Medium Irrigation Scheme (2/2)

Activities	Expected Results	Schedule (Year)								Agencies in Charge	Inputs	Remarks
		1st	2nd	3rd	4th	5th	6th	7th	8th			
2) Training for farmers - Awareness programme for O&M - Irrigation planning and scheduling - Water distribution and monitoring	- Farmers can manage the irrigation facilities by themselves.									- ID, IMD	IMD, ID and external staff Vehicles and equipment Training facilities Training equipment	- Farmers are responsible for O&M of facilities below D-canals.
4.3 Improving agricultural activities.												
4.3.1 Promote OFC cultivation.	- Extent OFC occupies about 10% of paddy area in Yala.									- PDOA (NWP)	PDOA (NWP), Farmer Animator, etc.	- Promoting activities are done independently by FO, and PDOA (NWP) provide necessary information and guidance to them.
4.3.2 Strengthen agricultural extension services.												
1) Field programs - Adaptive trials - Small-scale demonstration - Cropping pattern demonstration - Large-scale demonstration - Productivity increase programme - IPM	- Level-up farmers' knowledge for crop diversification and proper farming practices of crop									- PDOA (NWP)	PDOA (NWP), DOA, Farmer Animator, etc.	Demonstration, trial, IPM etc. Necessary cost is funded by the Project.
2) Farmer training programmes - Induction farmer training - Induction farmer guidance - Field day - Workshop/mass guidance - Seed campaign - Study tour	- Improve farmers' technique for crop cultivation											
3) Seed production programme	- Bringing-up of seed growers									- PDOA (NWP)	- Provision of registered seeds, technical guidance of AI	
4.3.3 Improve marketing of farm inputs and outputs.												
1) Improve marketing of farm inputs - Establishing group purchasing system of farm inputs	- The farmers can purchase adequate quantity of farm inputs before the season.									- IMD, ASC	- DO/ASC, PDOA (NWP), Institutional Officer/IMD, Animator	- Group purchasing system is linked with agricultural extension and group loan.
2) Improve marketing of farm outputs - Establishing pola - Establishing collecting point of farm products - Establishing cooperative shipping - Establishing marketing information service - Improving quality of products	- Improve access to market for selling products.									- ASC/DAS - ASC/DAS - ASC/DAS - PMU - ASC/DAS	- No facilities - No facilities - No facilities - Bulletin of KARTI - No facilities	Improving activities are done independently by FO, and ASC/DAS provide necessary information and guidance to them.
4.3.4 Improve access to credit services. - Introducing group loan system (cultivation loan) - Introducing revolving loan system (medium term credit) - Promoting multi aid credit	- Improve access to credits for purchasing farm inputs, agri. equipment and capital of income generating activities.									- PMU, banks & DAS - PMU, DAS - ASC/DAS	- Loaned by private banks - FO's owned capital or arranged by PMU.	
4.3.5 Promote reforestation in the catchment area.	- Deforestation in the catchment area is reduced.									- PDOA (NWP), ASC/DAS	- Seedlings	- FO promotes planting of tree crops in the catchment area.
4.3.6 Establish surveillance system of wild elephant in FOs.	- Damage by elephant is decreased.									- ASC/DAS		- Provincial seed farm (Galugamwa) is improved by the Project.
(Follow-up programme)										- IMD, DAS		



Development Plan of Mahananneriya Medium Scheme

17.3.5 Mahananneriya Minor Scheme Group (Cascade)

(1) General

Mahananneriya minor scheme group (Cascade) consists of six minor schemes of Kallanchiya, Arthikulama, Ihalagama, Palumailawa, Tambare, and Iharananneriya. These groups of minor schemes are located in the midpoint of Anuradhapura and Kurunegala and Mahananneriya medium scheme is located in the downstream of the cascade. Total number of farm households of the minor schemes is 450 and the irrigated paddy area is 117 ha. The farmers' organisation is organised into five in the scheme that Palumailawa and Iharagama are in one FO. The present situation is described in Table 15.1.1.

The PDM of Mahananneriya minor schemes is shown on page 17-58. The development plan is formulated as "economical status of the rural community is improved" for the Project purpose and the target group is farmer/community. The detail contents are given in the table of the Plan of Operation on page 17-59 and the Project layout map is shown on page 17-61. The summary of the plan of the scheme is as follows.

(2) Strengthening Farmers' Organisation

The concrete plans for the strengthening programmes of FO are as follows.

1) Awareness Programme and Educational/Training Programmes

Awareness programme

Awareness programme is applied for the both "Farmers" and "Official institutions" as mentioned before. Its contents and implementation procedure are as detailed in Section 9.2. The multifunctional FO is to be established through this programme with self-motivation of the entire community.

Education/ training programme

Following education/training programmes for fostering leaders of the multi-purpose FO are to be conducted.

**Education/Training Programmes for FO Leader
– Mahananneriya Minor Scheme Group**

Training Subject	Contents	Training Method
1) Draft preparation of the Articles of Organisation amendment	Draft preparation of the Articles of Organisation and knowledge of the systems and the procedures required on the process.	Lecture in Mahananneriya Agrarian Service Centre (ASC/DAS) and practical training by Farmer Animator.
2) Practical training the basic operation and management of the organisation	Planning, participatory management, practical operation & management of FO, practical financial management, financial resource management, role & systems of Official concerned, etc.	

(continued)

3) Training on the income generation activity	Practical; training of the operation/management of Rural Credit (Group-loan, Revolving-loan) and co-operative purchasing/selling.	Lecture by ASC/DAS, IMD, private bank (PMU arranges with banks) & practical training by Farmer Animator.
4) Information network formation/Awareness training	Establishing information networks with external organisations for collecting and sharing information in and around the community.	Holding joint workshops with external organisations and the 5 FOs for sharing information.

These programmes are conducted separately from the Awareness programme within the regular works of Mahananneriya ASC. Education and training facilities of Mahananneriya ASC are to be improved and strengthened (refer Chapter 17.4). The upper two schemes of the Mahananneriya minor schemes are supported by Galgamuwa ASC, and the lower four schemes are by Mahananneriya ASC at present. In order to develop uniformity of the cascade, the support to the entire six schemes by Mahananneriya ASC is proposed.

2) Establishment of Multifunctional Farmers' Organisation

The present FOs are to be reorganised to be multifunctional. Major change in the reorganisation is to set subcommittees under the executive committee and acting on irrigation, agriculture, business of FO, and income generation/social services.

Setting up the Subcommittee – Mahananneriya Minor Scheme Group

Subcommittees	Purposes and Activities
1) Irrigation	i) Water management, ii) O&M of facilities, iii) Safety operation of irrigation facility, iv) Estimation & collection of Irrigation Service Fee (ISF), and v) Survey on lease/tenant of farmland
2) Agriculture	i) Collaboration with official extension works, ii) Holding technical extension seminar, iii) income generation activity (Home garden and livestock development), iv) Operation of group works as pest control, v) Reforestation in the catchment area (Fruits trees), and vi) Control elephant damage (strengthening control by FO)
3) Businesses of FO	i) Establishment and operation of co-operation purchasing/selling, Pola/collection point, ii) Operation and management of the rural credit service (group loan, revolving loan), iii) Business of FO as farm machinery rental service, inland fishery, agro-processing, etc.
4) Income generation/Social Services	i) Income generation activities as Vocational training, small-scale enterprise/business, self-employment, ornamental fish culture and collection of employment information, ii) Promotion of mutual aid credit system, iii) Financial support for income generation, and iv) Promotion of anti alcohol addict campaign, social welfare, health & sanitary improvement.

An audit section is proposed to be set for maintaining transparency of FO activities and employing volunteers for close communication with FO members.

3) Income Generation/Social Services through Farmers' Organisations

The subcommittees of "Agriculture" and "Income Generation/Social Services" are carried out income generation activities for farmers and community. The income generation/social services are to be carried out by the self-

motivation of FOs and are targeting poverty groups in the community. Necessary information is to be provided through Mahananneriya ASC and Farmer Animators. The training facilities of NYSC are to be utilised for vocational training, so no extra facility is constructed by the Project.

4) Construction of Farmer Centre

There is no office facility for FO in Mahananneriya minor schemes. Farmer centres are to be constructed for maintaining smooth FO activities and the communication with official institutions concerned. Five centres are to be constructed in the schemes. The operation and management are to be carried out by the FO and the detail is described in Section 17.4.2.

(3) Distribution of Proper Irrigation Water

1) Rehabilitation and Improvement Plan of Irrigation Facilities

The rehabilitation and improvement works in Mahananneriya minor schemes are as follows: (Iharagama scheme is excluded due to the rehabilitation plan is not available)

Rehabilitation and Improvement Plan for Mahananneriya Minor Scheme Group

Category	Item	Quantity	Description of works
Tanks	Bund	L.S.	Bund widening, Slope protection, Earth filling
	Sluice	L.S.	Repair and replacement of sluices
	Spillway	L.S.	Minor repair, Downstream protection
	Others	L.S.	De-silting, Bathing step
Main canal	Earthworks	3,300 m	Embankment
	Structures	52 Nos.	Turnout
	O&M Road	2,000 m	Earth filling, Gravelling

Most of the rehabilitation and improvement works in the minor irrigation schemes are carried out for tank. In Ihalananneriya scheme, de-silting of the tank reservoir area is to be conducted.

The works for tank is to be carried out by constructors and the works for main canal is to be conducted by either contractors or farmers. The training courses for rehabilitation and improvement works are programmed in order to reflect farmers' proper intention toward the works and to smoothly carry out the works by the farmers themselves. The following training course for the government staff and the farmers are to be applied.

Training Programme for Rehabilitation and Improvement Works – Mahananneriya Minor Scheme Group

Activities	Session	Period	Lecturer	Subject of training
Training for the government staff	First	1day, pre-construction	RATPA	Participatory planning, communication with farmers
	Second	1day, in the construction	PED	Skill of technology transfer to farmers
	Third	1day, post-construction	PED	Hand-over of O&M responsibility to farmers, follow-up programme

(to be continued)

Training for farmers	First	2 days, pre-construction	RATPA	Participatory planning, field investigation, design and cost estimate
	Second	1 day, pre-construction	PED	Contract for rehabilitation works, farmers' contribution
	Third	2days, in the construction	PED	Quality control for earthworks and concrete, preparation of document for rehabilitation, field inspection
	Fourth	1day, post-construction	PED	Follow-up programme

RATPA: Research and Advisory Team for Participatory Approach

Education/training for officers is applied one course for the Provincial technical staff. One course is to be conducted for farmers, the office bearers of FOs and the member of the irrigation subcommittee.

2) Training for Water Management

The training programme on water management for farmers is proposed as follows:

Training Programme for Water Management – Mahananneriya Minor Scheme Group

Activities	Session	Period	Lecturer	Subject of training
Training for farmers	First	1day, pre-construction	RATPA	Awareness programme, communication with government staff, communication among farmers, communication with other FOs
	Second	1.5days, post-construction	ID, PED	Preparation of water distribution programme, skill for gate operation of tank and off-takes
	Third	1day	ID, PED	Follow-up programme

RATPA: Research and Advisory Team for Participatory Approach

Education/training is to be conducted one course at three locations for two schemes each and the office bearers of FOs and the subcommittee members are to be participants.

3) Training for O&M of Irrigation Facilities

The training on O&M of irrigation facilities for farmers is proposed as follows:

Training Programme for O&M– Mahananneriya Minor Scheme Group

Activities	Session	Period	Lecturer	Subject of training
Training for farmers	First	1day, pre-construction	RATPA	Awareness programme
	Second	1.5days, in the construction	ID, PED	Preparation of maintenance programme, organising a patrol, organising a Sramadana, collection of O&M charge
	Third	1day	ID, PED	Follow-up programme

RATA: Research and Advisory Team for Participatory Approach

Education/training is to be conducted one course at three locations for two schemes each and the office bearers of FOs and the subcommittee members are to be participants.

(4) Improvement of Agriculture Activities

1) Promotion of OFC Cultivation

The results of PCM workshop have raised the paddy productivity as well as promotion of OFC cultivation. However, water resources potentials of Mahananneriya minor schemes and its potential for increasing cultivation area after the project implementation are high (refer Section 9.4.3). Traditionally farmer practices paddy cultivation when water is available in the field. Therefore, Paddy strengthening cropping pattern is proposed and also an increase of OFC cultivation in Yala. The proposed cultivation area and production of respective crop are as follows, and the proposed cropping system is shown in Figure 15.3.1.

**Cropping Area and Production With & Without Project
– Mahananneriya Minor Scheme Group**

	Without Project			With Project			Increase (ton)
	Area (ha)	Yield (ton/ha)	Production (ton)	Area (ha)	Yield (ton/ha)	Production (ton)	
Paddy - Maha	68	3.16	215	97	5.0	485	270
- Yala	5	4.40	22	42	5.0	210	188
OFC							
- Maize	9	2.20	20	-	-	-	-20
- Sesame	2	1.09	2	1	0.9	1	-1
- Pulses	3	0.22	1	1	1.5	1.5	0.5
- Chili	5	0.56	3	1	1.5	1.5	-1.5
- B'onion	-	-	-	1	10.0	10	10
- Red onion	-	-	-	-	-	-	-
- Vegetables	2	1.48	3	1	10.0	10	7

2) Strengthening Agricultural Extension Services

Major technical improvements required for promoting OFC cultivation and increasing paddy productivity in Mahananneriya minor schemes are as follows.

OFC Promotion	Increase Paddy Productivity
<ul style="list-style-type: none"> - Introduction of group cultivation of OFC. - Introduction of appropriate cultivation technique. - Collection of market information. - Improvement of cultivation technique. - Preparation of OFC seed. - Improvement of rural credit. - Improvement of OFC marketing system. 	<ul style="list-style-type: none"> - Introduction of appropriate cultivation technique. - Dissemination of quality seed. - Dissemination of appropriate seed rate & plant density. - Straight fertiliser & organic material use. - Practice of IPM. - Effective labour use.

PDOA of North-western province is to conduct following extension activities for promoting OFC cultivation and increasing paddy productivity. Agriculture subcommittee of the FO is to carry out education activity for group cultivation. Improvement of marketing inputs materials and the rural credit are mentioned in Sections 3) and 4).

Agriculture Extension Activity – Mahananneriya Minor Scheme Group

Programme	Objectives	Method & Required Materials
1) Field Trial / Demonstration Programme - Adaptive trials - Small-scale demonstration - Cropping pattern demonstration - Large-scale demonstration - Productivity increase programme - IPM programme	- To develop technology for improving productivity - To demonstrate recommended practices & irrigation technique on crop diversification & crop productivity increase.	<ul style="list-style-type: none"> ● Conducted by PDOA of North western province. ● Use farmers' field for demonstration ● Farmer training programme including quality seed campaign, field tour ● Seed production programme include provision of register seed and technical guidance. Production expense is born by farmers.
2) Farmer Training Programme - Induction farmer training - Induction farmer guidance - Farmer training - Workshop - Quality seed campaign - Study tour	- To disseminate cultivation technique directly to farmers.	<ul style="list-style-type: none"> ● Required material cost for extension activities are born by the Project. Details are shown in Tables R 3.2-1/12 to 7/12 of Appendix-R.
3) Seed Production Programme - Paddy seed production - OFC seed production	- To foster seed production farmers.	

3) Improvement of Marketing of Agricultural Outputs and Inputs Materials

Improvement of inputs materials

Co-operative purchasing of input materials is proposed by FOs. This system is to carry out by linking to a group loan to be mentioned in the improvement of rural credit of the item 4). Awareness and education to Mahananneriya ASC is to be attempted for introducing the system.

Improvement of outputs

Following marketing improvement programme is proposed. These activities are to be carried out by FOs (FO business subcommittee).

Improvement Programme of Marketing Agricultural Products – Mahananneriya Minor Scheme Group

Programme	Objectives	Method & Required Materials
1) Setting Pola	To activate marketing of farm products by open Polas. To sell small quantity products from home gardens.	<ul style="list-style-type: none"> ● Polas are managed by FOs ● Proposed that Pola is to set without any construction and no Pola fee is to charge. ● Guidance for setting Pola is to be carried out to FOs by Mahananneriya ASC/DAS and suitable location and day are to be decided by contact with merchants.
2) Setting Collecting Point of Farm Products	To set contact points of producers with merchants on outputs marketing.	<ul style="list-style-type: none"> ● No required materials for setting the system. ● Selections of merchants and locations are determined by farmers and Proceeded by FOs.
3) Establishing Co-operative Shipping System	To sell products regularly and develop new markets.	<ul style="list-style-type: none"> ● Mahananneriya ASC/DAS is provide guidance to both merchants and FOs on collecting points and co-operative selling.

(continued)

4) Establishing of Market Information Collection	To collect information of market prices.	<ul style="list-style-type: none"> ● Regular purchasing of KARTI publication. PMU will provide information on purchasing.
5) Improving Quality	To improve quality of products.	<ul style="list-style-type: none"> ● No required materials. ● Mainly operating for women groups. ● Quality standard of products is not established and it is judged by merchants. FOs have to collect information of quality and disseminate to farmers. ● Mahananneriya ASC/DAS is to provide guidance on information collection.

4) Improvement of Rural Credit

In order to improve rural credit, introduction of the following three loans is proposed.

Improvement of Rural Credit – Mahananneriya Medium Scheme

Programme	Objectives	Method & Required Materials
1) Introduction of Group Loan (cultivation loan)	For purchasing inputs materials. Linkage with co-operative purchasing system.	<ul style="list-style-type: none"> ● Mainly loan by private banks. It is considered to be possible to introduce for group loan by private banks, because this loan is practised at present. PMU is to request to banks on introduction. ● The system management/operation of farmer sides is carried out by FOs (subcommittee) ● Mahananneriya ASC/DAS is to educate FOs on the introduction and training FO leaders on the operation works.
2) Introduction of Revolving Loan (medium term loan)	For purchasing farm machinery and financing small-scale enterprise.	<ul style="list-style-type: none"> ● Operation & management by FOs (subcommittees). Principally the fund is to be prepared by FOs. If its capital is insufficient, FOs obtain a loan from bank, and PMU provides support services to FOs. ● Galgamuwa ASC/DAS is to provide training for lending works.
3) Introduction of Mutual Aid Credit system	For emergency need on living or financing of self-employment.	<ul style="list-style-type: none"> ● Loan from the Women's Bank. ● Mainly operating for women groups. Income Generation/ Social Services Subcommittee is deal with education but not on operation.

5) Promotion of Reforestation in the Catchment Area

Planting of fruit trees such as mango and jackfruit is to be promoted for the environment conservation in the upper part of tank of the catchment area. The agriculture subcommittee of the FO is to carry out this fruits cultivation and PDOA is to provide technical guidance and seedlings.

6) Establishment of Watch and Protection System for Wild Elephant

It is proposed to set several observation points in the elephant infested area and organise the watching and protecting system among the community members. The agriculture subcommittee of the FO is to operate and manage the system and the FO is to be equipped with thunder-flashes and crackers.

Project Design Matrix - Mahananneriya Minor Irrigation Schemes (Cascade)

Name of Project	: Mahananneriya Minor Schemes Development Project for Irrigated Agriculture and the Community		
Project Area	: Mahananneriya Minor Irrigation Schemes (Cascade) (Kallanchiya, Arthikulama, Mailewa, Ihalagama, Thambare, and Ihala Nanneriya)	Duration	: 5 years
Executing Agency	: Ministry of Irrigation and Power (MIP) / Provincial Engineering Department	Target Group	: Farmers / all villagers in the Mahananneriya Minor Schemes (Cascade)
			Date : 31 May 2000

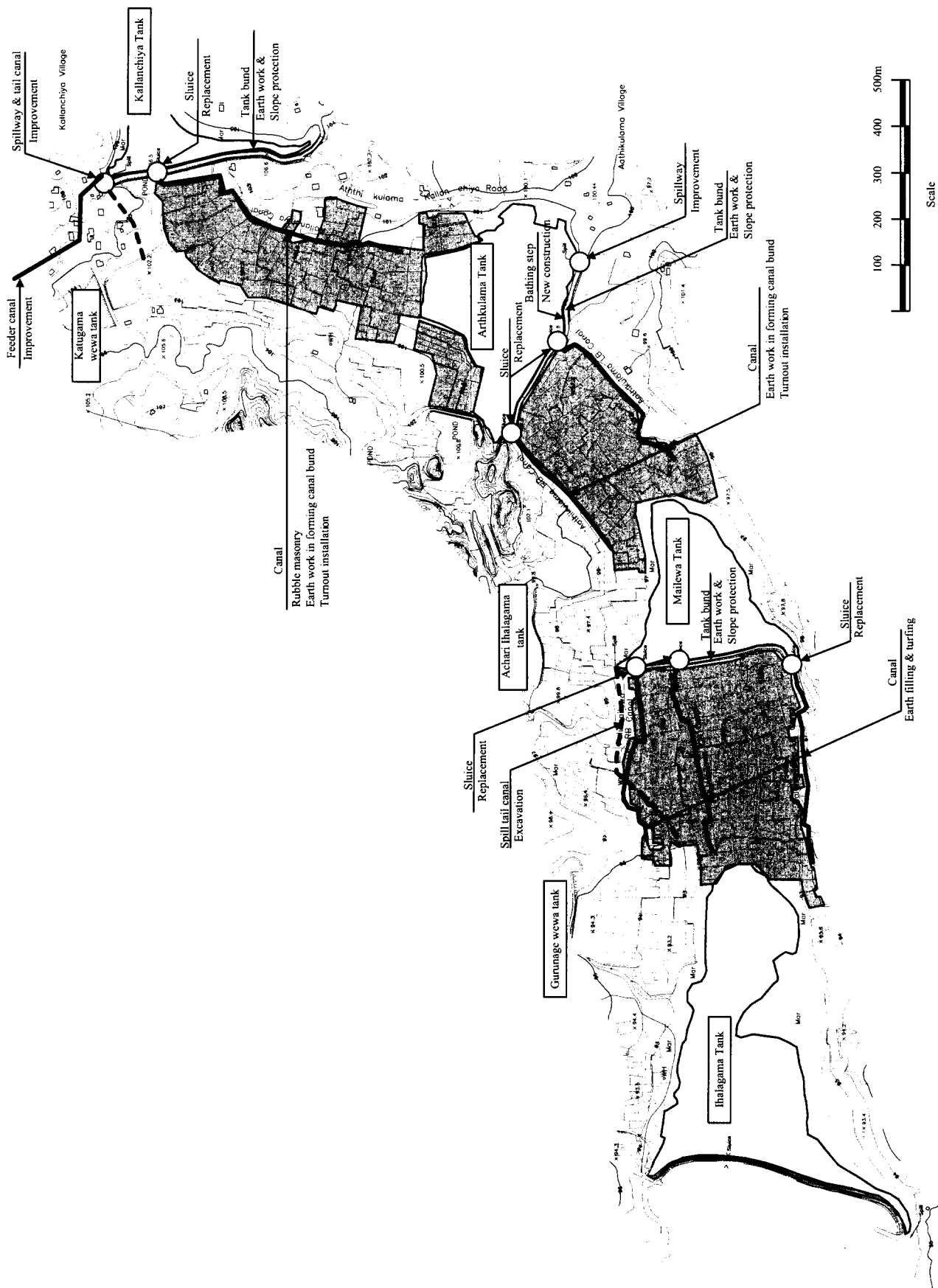
Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
1.1 Achieving sustainable development of regional agriculture	1.1 Development activities are planned and implemented independently by FOs and farmers themselves.	1.1 Monitoring reports of the project office (PMU)	Agricultural policy of the Government not hinder implementation of the project.
1.2 Improving agricultural productivity of the rural community	1.2 Agriculture is economically feasible.	1.2 Monitoring reports of PMU	
Project Purpose			
2.1 Socio-economic status is improved.	2.1 Total gross income of farmers increase progressively by the end of the project.	2.1 Monitoring reports of PMU	Agricultural products do not have to face unreasonable competition from imported products.
Outputs			
3.1 FOs having multi functions relating to irrigation, agriculture, small enterprises, income generations, social services are established and activated.	3.1.1 FOs provide various services including income generation, etc. from the 3rd year after commencement of the project.	3.1.1 Minutes of FOs' general meeting and monitoring reports of PMU	There is no extreme natural disaster (drought, heavy rain, etc.). Government enforces existing rules and regulations to protect environment. Other sectors have no drastic and sudden change in the economic activities. Social conditions in the community have no drastic change. The project has no adverse effect from the other development projects, even if they overlapped.
3.2 Irrigation water is properly supplied in accordance with a schedule.	3.1.2 Committee and sub-committee meetings are held monthly by the 3rd year after commencement of the project.	3.1.2 Minutes of FOs' committee and sub-committee meetings	
3.2.1 Irrigation facilities are rehabilitated and improved.	3.2 Farmers are able to receive water in accordance with a schedule by the end of the project.	3.2 Monitoring reports of PMU	
3.2.2 Proper water management is done by FOs.	3.2.1 Facilities necessary for proper water supply are repaired and improved by the 3rd year after commencement of the project.	3.2.1 Monitoring reports of PMU	
3.2.3 Irrigation facilities are maintained.	3.2.2 Over 80% of farmers attend Kanna meeting from 4th year after commencement of the project.	3.2.2 Minutes of Kanna meeting	
3.3 Agricultural activities are improved.	3.2.3 Over 80% of farmers participate "Shramadana" from 4th year after commencement of the project.	3.2.3 Records of FOs.	
3.3.1 OFC cultivation is expanded.	3.3 Agricultural productivity of farmers is improved from the 3rd year after completion of construction works.	3.3 Animators' field survey reports and records of ASC (AI)	
3.3.2 Yield of paddy and OFC are increased.	3.3.1 Extent of OFC occupies about 10% of paddy area in Yala by the end of the project.	3.3.1 Animators' field survey reports	
3.3.3 Marketing of farm inputs and outputs is improved.	3.3.2 Yields of crops reach the level of "projected yields" by the 3rd year after completion of construction works.	3.3.2 Animators' field survey reports	
3.3.4 Access to credit services is improved.	3.3.3 (1) Group purchasing of farm inputs is implemented actively by the 3rd year after commencement of the project.	3.3.3 (1) FOs' account books and financial reports in FOs' general meeting	
3.3.5 Deforestation in the catchment area is reduced.	3.3.3 (2) Collecting point for OFC is established in the area by the 3rd year after commencement of the project.	3.3.3 (2) Animator's field survey reports	
3.3.6 Damage by elephant is decreased.	3.3.4 Group loan, revolving loan and multi-aid credit systems are established by the 3rd year after commencement of the project.	3.3.4 Reports of Banks, monitoring reports of PMU	
	3.3.5 FOs/farmers start planting of tree crops in the catchment area from the 3rd year after commencement of the project.	3.3.5 Animator's field survey reports	
	3.3.6 Surveillance system of wild elephant is established in FOs by 3rd year after commencement of the project.	3.3.6 Animators' field survey reports	
Activities	Inputs		
4.1 Strengthening FOs.	Foreign Donor	Sri Lankan Side	Trained Officers stay with the project. Local government and front line officers positively support the project. No action will be taken by government to destabilize local market.
4.1.1 Implement awareness and training programmes.	Mobilization	(1) Sri Lankan Government	
4.1.2 Reorganize FOs to have multi function.	Awareness and training costs	Manpower - Local engineers/experts	Pre-conditions The Sri Lankan Government raises all project funds including foreign currency portion, local currency portion and recurrent cost of PMU. MIP and agencies concerned establishes organization to implement project. To operate the project, necessary officers and physical facilities are provided by MIP and agencies concerned.
4.1.3 Implement income generation and social services through FOs.	Rehabilitation & improvement cost	- Administrative officers	
4.1.4 Construct Farmer Centres	Equipment - Vehicles	- Supporting staff	
4.2 Supplying irrigation water in accordance with schedule.	- O&M equipment	Facilities of PMU	
4.2.1 Rehabilitate and improve irrigation facilities.	- Agri. extension	Recurrent cost for project implementation	
4.2.2 Improve water management.	Facilities	(2) Farmers	
4.2.3 Strengthen O&M of irrigation facilities.	- Facilities for agri. extension (including provincial seed farm of Galugamwa)	10% of rehabilitation and improvement cost of all irrigation facilities	
4.3 Improving agricultural activities.	- Farmer centers	(3) NGO for implementing awareness and training programmes	
4.3.1 Promote OFC cultivation.	Monitoring cost		
4.3.2 Strengthen agricultural extension services.	Cost for engineering services		
4.3.3 Improve marketing of farm inputs and outputs.	Physical contingency		
4.3.4 Improve access to credit services.	Price contingency		
4.3.5 Promote reforestation in the catchment area.			
4.3.6 Establish surveillance system of wild elephant in FOs.			
		Total Project Cost	

Plan of Operation - Mahananneriya Minor Schemes (Cascade) (1/2)

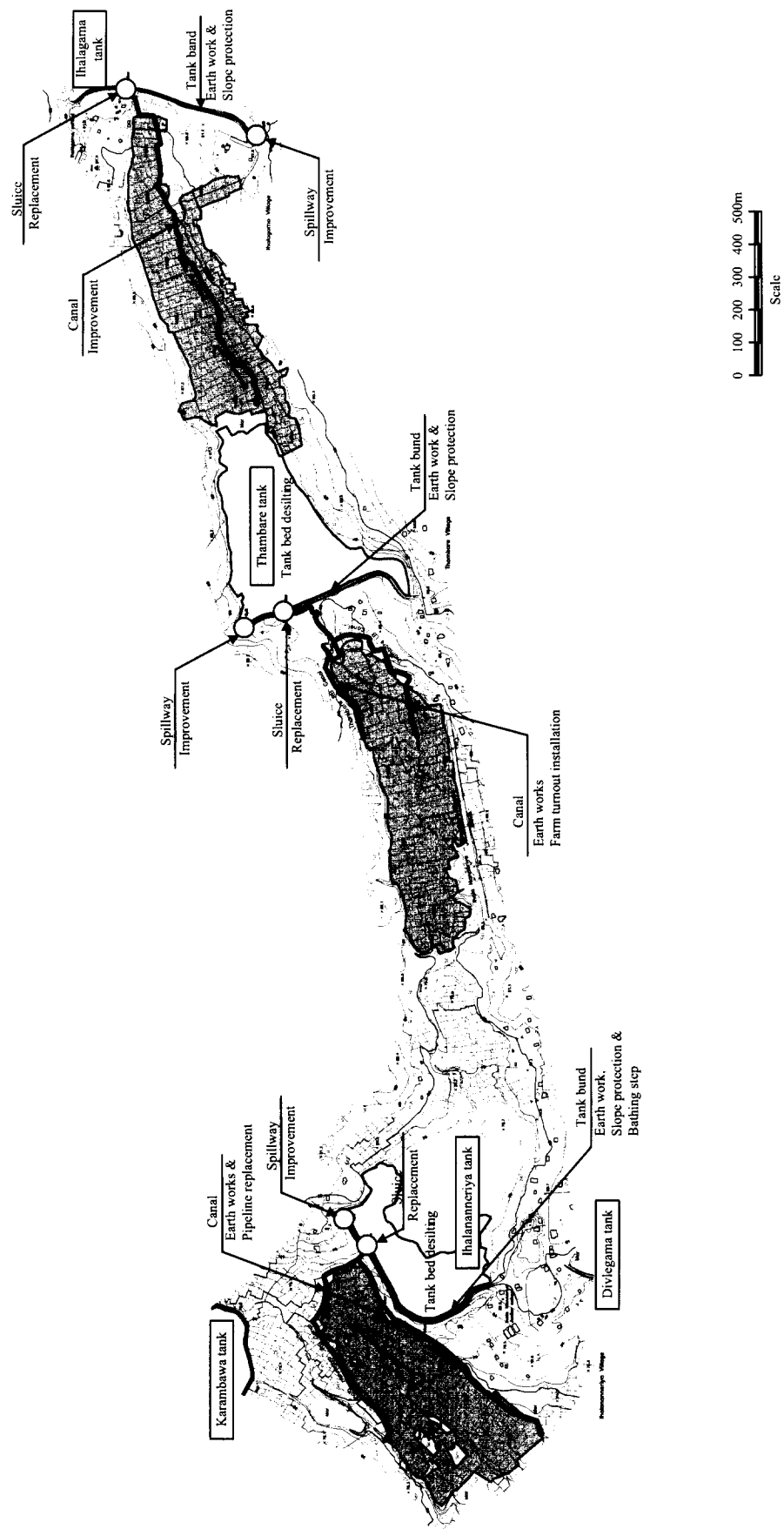
Activities	Expected Results	Schedule (Year)								Agencies in Charge	Inputs	Remarks
		1st	2nd	3rd	4th	5th	6th	7th	8th			
1. Mobilization of PMU 2. Awareness programme: Officers of agencies concerned												
4.1 Strengthening farmers' organisation.												
4.1.1 Implement awareness and training programmes. 1) Awareness programme 2) Training to FOs' leaders for operation and management of FOs	- Level-up farmers' and community people's knowledge for FOs. - Development component is implemented independently by FOs/farmers.									- PMU (KARTI) - ASC/DAS, IMD	- Trainers, moderators - DO/ASC, Farmer Animator - Organizational expert (IMD)	- Providing training programme for participatory planning - A Community Coordinating Committee (CCC) is established in each community. - Re-organization is decided by the community's general meeting. - Providing necessary guidance and information for re-organization
4.1.2 Reorganize FOs to have multi function. 1) Establishing organization of multi-function 2) Guidance for preparing articles & by-laws for organization of multi-function	- FOs are strengthened by rising in social standing through providing various services to the community.									- ASC/DAS, IMD - ASC/DAS, IMD	DO/ASC, Farmer Animator Organizational expert (IMD)	
4.1.3 Implement income generation and social services through FOs. 1) Home garden development 2) Livestock development 3) Inland fisheries development 4) Vocational training 5) Employment information services 6) Small enterprises and business 7) Providing social services 8) Credit services for income generation	- Increasing farmers' income									- PDOA (NWP) - PDAPH - NAQDA - NAITA, NYSC - NYSC - SEDD/MYASRD - ASC/DAS - ASC/DAS	- Extension officers - Extension officers - Extension officers - Instructor - Instructor - Instructor - DO/ASC, Farmer Animator - DO/ASC, Farmer Animator	- Income generating activities are implemented independently by FO. - FOs establish a "Sub-committee for Income Generation and Social Services" for dealing income generating activities.
4.1.4 Construct Farmer Centres.	- Keep efficient management of FOs and close communication between FOs and agencies concerned or within communities.									- ASC/DAS, IMD	- Farmer centre x 5nos.	- Multi-purpose center with office room for FO & Animator, meeting places and temporary store space of farm inputs for cooperative purchasing
4.2 Supplying irrigation water in accordance with schedule.												
4.2.1 Rehabilitate and improve irrigation facilities. 1) Investigation, detailed design & tendering (including training for farmers and staff) 2) Implementation of rehabilitation / improvement 3) Turnover process of facilities (including training for farmers and staff)	- Farmers participation to formulate the plan can be promoted. - Proper water management and O&M can be achieved. - Irrigation facilities can be handed over in proper condition.									- ID, IMD - ID - ID, IMD	- Staff in ID & IMD, farmers - Staff in ID (Contractors), farmers - Staff in ID & IMD, contractors and farmers	- Canal structures to be rehabilitated (regulators, turnouts, measuring devices, etc.) - Rehabilitation of F-canals are carried out by farmers.
4.2.2 Improve water management. 1) Training for the government staff - Awareness for water management - Irrigation planning and scheduling - Water distribution and monitoring 2) Training for farmers - Awareness for water management - Irrigation planning and scheduling - Water distribution and monitoring	- Capacity of the staff for water management is improved. - Proper water management is done by the farmers (FOs).									- ID, IMD - ID, IMD	ID and external staff Vehicles and equipment Training facilities Training equipment IMD, ID and external staff Vehicles and equipment Training facilities Training equipment	- ID is responsible for water management of main irrigation facilities. - Farmers are responsible for water management below D-canals.
4.2.3 Strengthen O&M of irrigation facilities. 1) Training for the government staff - Awareness programme for O&M - Irrigation planning and scheduling - Water distribution and monitoring	- Capacity of the staff for O&M is improved.									- ID, IMD	ID and external staff Vehicles and equipment Training facilities Training equipment	- ID is responsible for O&M of main irrigation facilities.

Plan of Operation - Mahananneriya Minor Schemes (Cascade) (2/2)

Activities	Expected Results	Schedule (Year)								Agencies in Charge	Inputs	Remarks
		1st	2nd	3rd	4th	5th	6th	7th	8th			
2) Training for farmers - Awareness programme for O&M - Irrigation planning and scheduling - Water distribution and monitoring	- Farmers can manage the irrigation facilities by themselves.									- ID, IMD	IMD, ID and external staff Vehicles and equipment Training facilities Training equipment	- Farmers are responsible for O&M of facilities below D-canals.
4.3 Improving agricultural activities.												
4.3.1 Promote OFC cultivation.	- Extent OFC occupies about 10% of paddy area in Yala.									- PDOA (NWP)	PDOA (NWP), Farmer Animator, etc.	- Promoting activities are done independently by FOs, and PDOA (NWP) provide information and guidance to them.
4.3.2 Strengthen agricultural extension services.												
1) Field programs - Adaptive trials - Small-scale demonstration - Large-scale demonstration - Productivity increase programme - IPM	- Level-up farmers' knowledge for crop diversification and proper farming practices of crop									} PDOA (NWP)	} PDOA (NWP), DOA, Farmer Animator, etc.	} Demonstration, trial, IPM etc. Necessary cost is funded by the Project.
2) Farmer training programmes - Induction farmer training - Induction farmer guidance - Field day - Workshop/mass guidance - Seed campaign - Study tour	- Improve farmers' technique for crop cultivation											
3) Seed production programme	- Bringing-up of seed growers									- PDOA (NWP)	- Provision of registered seeds, technical guidance of AI	- Training, study tour etc. Necessary cost is funded by the Project.
4.3.3 Improve marketing of farm inputs and outputs.												
1) Improve marketing of farm inputs - Establishing group purchasing system of farm inputs	- The farmers can purchase adequate quantity of farm inputs before the season.									- IMD, ASC	- DO/ASC, PDOA (NWP), Institutional Officer/IMD, Animator	- Group purchasing system is linked with agricultural extension and group loan.
2) Improve marketing of farm outputs - Establishing pola - Establishing collecting point of farm products - Establishing cooperative shipping - Establishing marketing information service - Improving quality of products	- Improve access to market for selling products.									- ASC/DAS - ASC/DAS - ASC/DAS - PMU - ASC/DAS	- No facilities - No facilities - No facilities - Bulletin of KARTI - No facilities	} Improving activities are done independently by FOs, and ASC/DAS provide necessary information and guidance to them.
4.3.4 Improve access to credit services. - Introducing group loan system (cultivation loan) - Introducing revolving loan system (medium term credit) - Promoting multi aid credit	- Improve access to credits for purchasing farm inputs, agri. equipment and capital of income generating activities.									- PMU, banks & DAS - PMU, DAS - ASC/DAS	- Loaned by private banks - FOs' owned capital or arranged by PMU.	
4.3.5 Promote reforestation in the catchment area.										- PDOA (NWP), ASC/DAS	- Seedlings	- Group loans are provided through FOs, and invested to purchase farm inputs. - Loan for procurement of machinery & farm facility, and for capital of small enterprises - Loans for living and income generation and managed by women's group. - FO promotes planting of tree crops in the catchment area. - Provincial seed farm (Galugamwa) is improved by the Project.
4.3.6 Establish surveillance system of wild elephant in FOs.	- Damage by elephant is decreased.									- ASC/DAS		
(Follow-up programme)										- IMD, DAS		



Development Plan of Mahanannneriya Minor Schemes (Cascade) 1/2



Development Plan of Mahananneriya Minor Schemes(Cascade) 2/2

17.4 Proposed Plans for Strengthening of Agricultural Support Institutions

The strengthening plan of agricultural support institutions consists of “strengthening of agricultural extension services” and “support programmes for strengthening of agricultural support institutions.” The former includes field programmes such as adaptive trials and demonstration farms and farmers training programmes, and the latter is rehabilitation and improvement of agricultural extension facilities of the agencies concerned and levelling-up of staff capability. The former strengthening of agricultural extension services is explained in the each scheme in Section 7.3. In this section, the latter, the support programmes for strengthening of agricultural support institutions are described.

17.4.1 Proposed Areas to be Addressed and Support

The constraints or weakness in the agricultural support institutions identified in the present Study and the proposed agricultural development and income generation plans of the Project dictate that the areas to be addressed for the strengthening of agricultural support institutions for agricultural development should include: i) agricultural support facilities, ii) logistic support and staff training, iii) farmers/FOs support institutions and facilities, and iv) management system and institutional set-up for the agricultural support services. The same for the agricultural sector income generation plans include: i) upgrading of the provincial seed farm in Galugamuwa to expand its capacity to produce quality fruit planting materials, ii) upgrading of the IFTC, Nikaweratiya of the PDAPH, NWP and the logistic support strengthening of the project related PDAPHs, and iii) establishment of the Aquaculture Extension Centre (AEC), Anuradhapura of the NAQDA. The support programmes are summarised in the right table.

Support Programmes for Strengthening of Agricultural Support Institutions

Support Programmes	Institutions
Institutional Strengthening Programme	IPEU, PDOAs (NCP & NWP)
1) Logistic support strengthening	
2) Staff training programme	
3) Institutional strengthening	
4) Upgrading ISTI, M. Iluppallama	DAS, Kurunegala & Anuradhapura
Strengthening of Farmers/FOs Support Institutions & Facilities	
1) Establishment of “Farmer Centre”	
2) AS Centre strengthening programme	
3) Institutional strengthening programme	PDOA, NWP
Support Programmes for Income Generation	
1) Upgrading of Provincial Seed Farm, Galugamuwa	
2) Upgrading of IFTC, Nikaweratiya	
3) Establishment of AEC, Anuradhapura	NAQDA

17.4.2 Support Programmes

The support programmes for the strengthening of the agricultural support institutions have been formulated as follows, taking into account the income generation plans, irrigation works, crop sub-sector agricultural support programmes and other implementation schedules of the Project.

Institutional Strengthening Programmes

Support Programmes	Objectives	Implementation Method and Required Inputs
1) Logistic support strengthening	Strengthening of logistic support of PDOA & IPEU for the implementation & monitoring of support programs	<ul style="list-style-type: none"> ● Programme Components: Provision of motor cycles / computer set for IPEU, PDOA/NCP and PDOA/NWP ● Executing/Monitoring Agency: PDOAs of NCP & NWP, IPEU
2) Staff training programme - Induction Staff Training - Refresher/ In-service Training	To provide guidance on the Project & supporting services under the Project. Periodical training of extension/field staff, M&E and programme formulation for next season or year	<ul style="list-style-type: none"> ● Target Groups: AI, DO (staff of PDOA, PDAPH, NAQDA) ● Participants: 25 staff/course ● Duration & Training Method: 3 days (24 hours) in class & fields/course ● Total courses: 11 ● Executing/Monitoring Agencies: PDOA, IPEU/DOA, PDAPH, DAS, PMU
3) Institutional strengthening	- Strengthening of guidance/supervision/coordination, and research-extension-farmer linkage	<ul style="list-style-type: none"> ● Programme components: Strengthening linkage of Farmer, Extension and Research ● Executing agency: IPEU/DOA, PDOA/NCP, PDOA/NWP
4) Upgrading In-service Training Institute (ISTI), Maha Illuppallama	Strengthening of training activities on crop sub-sector in the Project area	<ul style="list-style-type: none"> ● Programme components: video camera x 1, video deck x 2, TV x 1, OHP & screen x 2, printing machine x 1, copy machine x 1, bus (60 seats)x 1 ● Executing agency: ISTI, PDOA of NCP ● O&M agency: ISTI, PDOA of NCP

Strengthening of Farmers/FOs Support Institutions & Facilities

Support Programmes	Objectives	Implementation Method and Required Inputs
1) Establishment of "Farmer Centre"	Establishment of facilities for effective activities of FOs and keeping close communication between agencies concerned and FOs or within community.	<ul style="list-style-type: none"> ● Programme Components: construction of farmer centre for each GN area or FO ● Specification of one farmer centre <ul style="list-style-type: none"> - Floor space: 140 m² - Layout: meeting hall x 1, office for FO & animator x 3 - Facilities: desk, chair, cabinet, telephone & solar battery ● Total number of centres: 27 (Periyakurama use the existing centre.) ● Executing agency: DAS(A'pura & K'gala) ● Operation and maintenance: FO
2) Agrarian Service Centre (ASC) strengthening programme	Strengthening of logistic support of the project related ASC to enhance support services in the Project areas	<ul style="list-style-type: none"> ● Programme Components: Motor cycles - Nachchaduwa ASC x 1, Galugamuwa ASCx 1, Mahananneriya ASCx 1 Renovation of building & training equipment - Nachchaduwa ASCx 1, Tirappane ASCx 1, Galugamuwa ASCx 1, Mahananneriya ASCx 1 ● Executing Agency: PMU ● O&M: DAS, A'pura & K'gala
3) Strengthening of Farmers/FOs Support Institutions		
- Provision of Vehicle/DAS	Strengthening of logistic support of DAS for support programmes implementation & monitoring	<ul style="list-style-type: none"> ● Programme Components: provision of vehicle, Anuradhapura x 1, Kurunegala x 1 ● Executing Agency: DAS, A'pura & K'gala ● Operation and maintenance: DAS, A'pura & K'gala
- Staff Training Programme	- To provide guidance on the Project & supporting services under the Project - To provide periodical pre-seasonal training on FO support & monitoring	<ul style="list-style-type: none"> ● Target Groups: (DO/DAS) , DAS district staff (Kurunegala, Anuradhapura) ● Participants: 25 staff/course ● Duration & Training Method: 3 days (24 hours) in class & fields/course, total courses: 11 ● Executing/Monitoring Agencies: DAS
- FO Leader Training	- To provide guidance on the Project & supporting services under the Project - To provide basic technical & methodological guidance on extension	<ul style="list-style-type: none"> ● Target Groups: Farmer Animators (ADPAs) ● Participants: 25 staff/course Participants: 25 staff/course ● Duration & Training Method: 3 days (24 hours) in class & fields/course, total courses: 11 ● Executing/Monitoring Agencies: DAS

Support Programmes for Income Generation

Support Programmes	Objectives	Implementation Method and Required Inputs
1) Upgrading of Provincial Seed Farm, Galugamuwa	Strengthening production of fruit planting materials at the Seed Farm & providing training for private nurseries	<ul style="list-style-type: none"> ● Programme Components: shade house for propagation (200 m²) x 2, office quarter (100 m²) x 1, shade house for seedlings (400 m²) x 2, storage tank x 1, pumping station x 1, irrigation system x 1, office facilities & training equipment x 1, vehicle (4 t truck) x 1 ● Executing Agencies: PDOA, NWP ● Operation and maintenance: PDOA, NWP
2) Upgrading of IFTC, Nikaweratiya	Strengthening & expanding of training activities on livestock husbandry in the Project area	<ul style="list-style-type: none"> ● Programme Components: Training building (120 m²) x 1, dormitory to accommodate 30 trainees (5 rooms x 40 m²/room) x 1, manager quarter (100 m²) x 1, dairy shed (20 cows) x 1, mini-size dairy laboratory x 1, micro-bus (30 seats) x 1 ● Executing Agency: PDAPH, NWP ● Operation and maintenance: PDAPH, NWP
3) Strengthening of Aquacultural Extension Centre (AEC), Anuradhapura	Establishment of aquacultural extension/support facilities for development of inland fisheries	<ul style="list-style-type: none"> ● Programme Components: extension centre building (200 m²) x 1, training equipment x 1, facilities of extension centre x 1, office facilities x 1, motor cycles x 2 ● Executing Agency: NAQDA ● Operation and maintenance: NAQDA

17.4.3 Proposed Management System and Institutional Set-up

(1) Concept for Establishment of Management System and Institutional Set-up

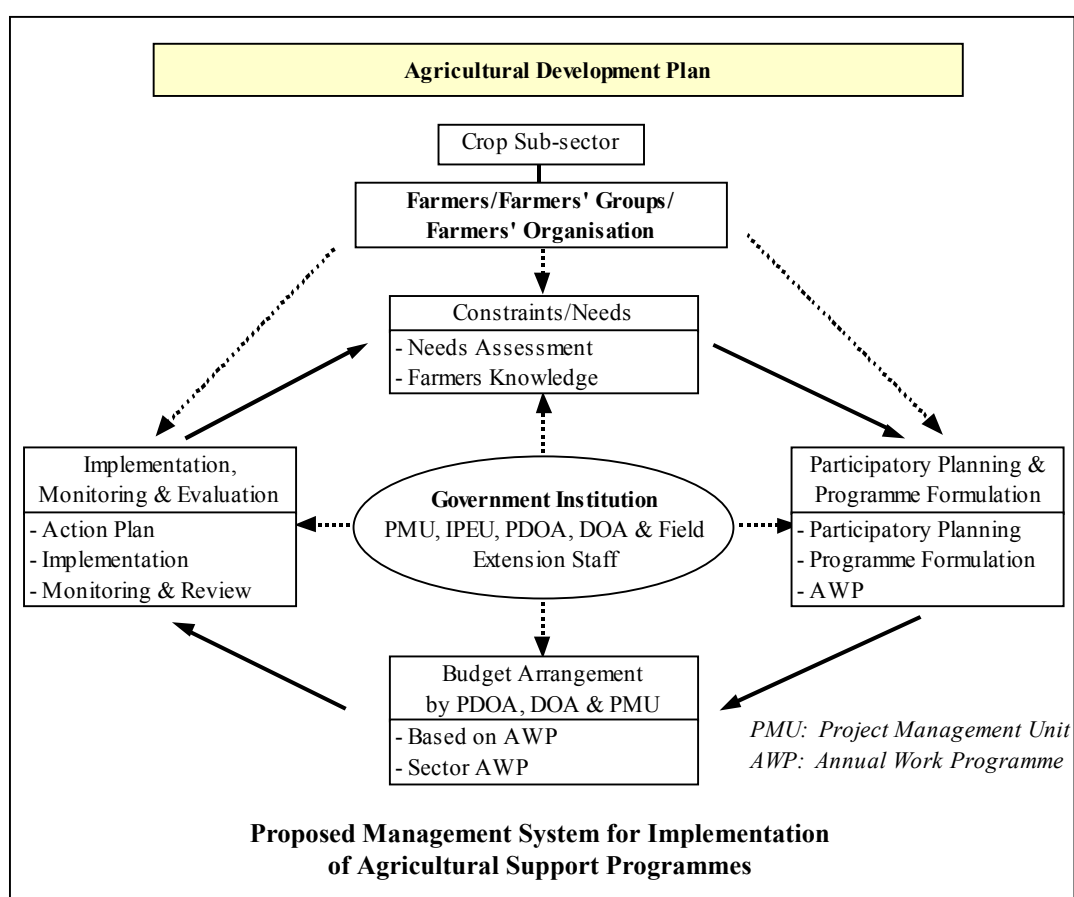
The concepts for the establishment of the management system and the institutional set-up for the planning, implementation and monitoring & evaluation of the agricultural support programmes under the Project are:

- Management of the planning and implementation of the agricultural support programmes is to be performed under the rolling plan concept, in which the Annual Work Programme (AWP), annual implementation schedule and annual cost schedule, of the individual project scheme is to be reviewed and updated annually on the basis of the lesson learnt from the implementation of the programs in a preceding year and the participatory approach for their planning,
- Strengthening of agriculture extension services in the crop sub-sector is to be aimed at within the present policy and institutional framework and through the strengthening of co-operation and collaboration between the IPEU/PDOAs and the DAS,
- Enhancement of farmers contribution in extension as well as institutionalisation of their participation in extension activities from the planning stage,
- Strengthening of research-extension-farmer linkage is to be sought within the programme implementation, and
- Management of support programmes of sub-sectors other than the crop sub-sector should be executed under the present system and under the

supervision of the project management body as the programmes in such areas are limited in scale.

(2) Proposal on Management System for Support Programme

On the basis of the said concepts, the management system for the implementation of agricultural support programmes under the Project is proposed as shown in Figures 17.4.1 and 9.9.2. The proposed management system consists of four basic actions of: i) identification of constraints and needs, ii) participatory planning and programme formulation (review and updating of AWP), iii) budget arrangement, and iv) programme implementation and monitoring & evaluation as shown in the following figure.



The extension system and research-extension-farmers linkage in the crop sub-sector similar to the currently established system should be established as shown in Figure 9.9.4 under the Project. The basic extension approaches involved in the system are: i) approach through farmer groups or FOs and ii) participatory approach in planning process; to be top-down as well as bottom-up and reciprocal. In the aspect of the research-extension-farmers linkage, the aim under the Project is the activation of the system and the strengthening of the linkage through the allocation of necessary fund and through the research related programme implementation.