ANNEX-G

INSTITUTIONAL DEVELOPMENT

ANNEX - G

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1.1 Farmers' Organisation and Handing-over of O&M

1.1.1 General Background

As the important strategy for water resources and irrigation development in MTADP, the Government has envisaged to develop small-scale and micro-scale irrigation schemes, and their common element is the emphasis given to the implementation and management of the schemes by the farmers themselves. This means that a considerable time and efforts have to be consumed for the promotion of effective farmers' groups, and operation and maintenance (O&M) of existing irrigation projects are handed over to them. The role of GIDA is to plan the implementation and assist the farmers' groups.

In line with this strategy, farmers' societies were established in all the project areas up to the present, and a federation (Irrigation Rice and Vegetable Co-operative Farmers and Marketing Association) which consists of all societies on GIDA's irrigation projects, was organised in Ashaiman in 1994. In parallel with the above activities, GIDA is now planning to hand over O&M of the irrigation facilities to the farmers' societies.

1.1.2 Farmers' Societies in the Project Areas

In each irrigation project area, a farmers' organisation had been established under the guidance of the Project Management Office (PM Office) and the Department of Co-operatives. An outline of these societies is shown in the following table, and the details are presented in Table G-1 and Figure G-1.

Outline of Existing Farmers' Societies in the Project Areas

Projects	Name of Farmers' Societies	No. of Member *1	Executive Staff*1	Year Established	Year Registered	Bye-Laws *2
(1) Ashaiman	Ashaiman Co-operative Irrigation Rice Farmers Society Ltd.	120	9	1983	1983	A
(2) Aveyime	Aveyime Irrigation Farmers Association	62	7	1981	1990	B
(3) Kpando-Torkor	Kpand-Torkor Co-operative Farmers' Society Ltd.	118	7	1974	None	None
(4) Mankessim	Beefikrom Cooperative Irrigation Vegetable Growers and Marketing Society Ltd.	89	7	1987	None	None
(5) Okyereko	Okyereko Irrigation Rice Farmers Co-operative	68	6	1994	None	None

*1 As of December 1995.
*2 A: Bye-Laws prepared on the basis of the form of the Department of Cooperative.
B: Bye-Laws not coincide with the form of the Department of Cooperative.
Source: Data and information obtained from each society.

A society has a committee consisting of a chairman, a vice-chairman, a secretary, a treasurer, an organiser, and several committee's members. They are all elected from the society's members. All beneficiaries of the irrigation project automatically become members of the society.

The objectives of these societies are (i) to produce crops on a collective farming basis, (ii) to arrange the sale of such products, (iii) to provide facilities for processing of products, (iv) to arrange the supply of farming and domestic necessities to their members, (v) to provide education and others, like amenities to the community as a whole, and (vi) to procure essential

commodities collectively and distribute them equally among the members.

Of the 5 societies in the project areas, the farmers' society of Ashaiman has bye-laws which consist of the following articles, and the society of Aveyime has uncompleted bye-laws. The remaining three (3) societies have no bye-laws.

Bye-Laws of the Existing Societies

Part-I Preliminary
- (1) Interpretation
- (2) Title
- (3) Objectives

Part-II General Provisions
- (4) Funds of Society
- (5) Liability of Members
- (6) Disposal of Surplus
- (7) Accounts and Books
- (8) Register of Members
- (9) Seal of Society
- (10) Division of Society
- (11) Loans and Deposit from Persons
- (12) Loans to Members
- (13) Production and Marketing of Produce
- (14) Admission to Membership
- (15) Withdrawal from Membership
- (16) Removal from Membership
- (17) Expulsion from Membership
- (18) Re-admission of Membership

Part-III General Meetings
- (19) General Meeting
- (20) Special General Meeting
- (21) Quorum at General Meeting
- (22) Voting at General Meeting
- (23) Minutes of General Meeting

Part-IV Committee of Management
- (24) Election of Committee
- (25) Removal of Committee
- (26) Filling of Committee
- (27) Chairman of Committee
- (28) Duties of Committee
- (29) Procedure at Committee Meeting
- (30) Minutes of Committee Meeting

Part-V Officers of the Society
- (31) Appointment of Secretary
- (32) Security by Secretary
- (33) Suspension of Secretary
- (34) Absence of Secretary
- (35) Payment of Secretary
- (36) Duties of Secretary
- (37) Treasurer and Assistant Treasurer
- (38) Duties of Treasurer

Source: Bye-laws of the Amate Co-operative (IDA) Vegetable Growers and Marketing Society Ltd. registered in 1993.

The bye-laws have been prepared in accordance with a form of the Department of Co-operatives, and none article on O&M of irrigation facilities is included in the above bye-laws. It means that the societies have no function as a water users' association in the institutional view point.

The present activities of the societies are mainly to discuss the amount of irrigation service charge and land allocation with the project offices. In addition, the societies established in the pump irrigation areas are arranging the installation of sprinkler systems under the guidance of the PM Offices. These societies have no other activities among the objectives mentioned in their bye-laws.

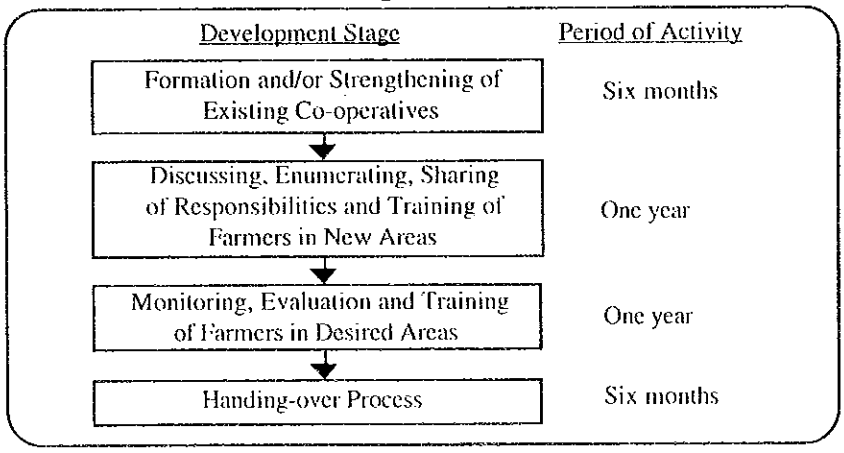
1.1.3 Handing-over of O&M

In accordance with the strategies of MTADP, GIDA has envisaged the handing-over of O&M to the farmers' societies established in each project area, as mentioned earlier. Basic concepts of this handing-over are:

(a) To gradually train the farmers to take over the management of the project, and transfer appropriate technologies to them through IDC in Ashaiman;
(b) To provide extension services to the farmers;
(c) To assist the farmers in O&M of the irrigation systems and other structures where possible; and
(d) To provide technical advice to farmers' groups, co-operative societies after transfer of project management responsibilities.

Based on the above concepts, GIDA has planned the following handing-over process. The details are shown in Table G-2.

Outline of Handing-over Process for O&M



In 1994, GIDA announced these concepts of handing-over to all societies through the PM Offices with a rehabilitation plan of irrigation facilities. Up to the present, all irrigation projects have been managed directly by GIDA and its plan has not yet been commenced, except for the Dawhenya Irrigation Project[1]. The farmers in all project areas have well known the handing-over of O&M to the farmers' societies, at present. In order to grasp their opinion on this handing-over, an interview survey was carried out. The result indicates that about a half of the samples (180 farmers) do not agree with the handing-over, as shown below.

Farmers' Acceptance of Handing-over of O&M

Questions	Ashaiman	Aveyime	K. Torkor	Mankessim	Okyereko	Whole
If GIDA hands over the operation and maintenance of the irrigation facilities:						
a) Do you agree ?						
Yes	15%	67%	-	89%	70%	48%
No	85%	33%	100%	11%	30%	52%
b) If your village chief agrees with the handing-over, do you also agree ?						
Yes	20%	67%	-	88%	50%	45%
No	80%	33%	100%	12%	50%	55%

Source: Farm interview survey by the Study Team (November-December, 1995).

As one of the reasons, it is pointed out that the farmers do not accept the GIDA's handing-over plan without rehabilitation works of the existing irrigation facilities, because they have confronted serious problems on the facilities such as insufficient water supply. Although GIDA have explained to the farmers that all facilities are rehabilitated before the handing-over, they have a doubt about the rehabilitation works by GIDA. It is necessary to explain more detailed handing-over process with actual rehabilitation plans.

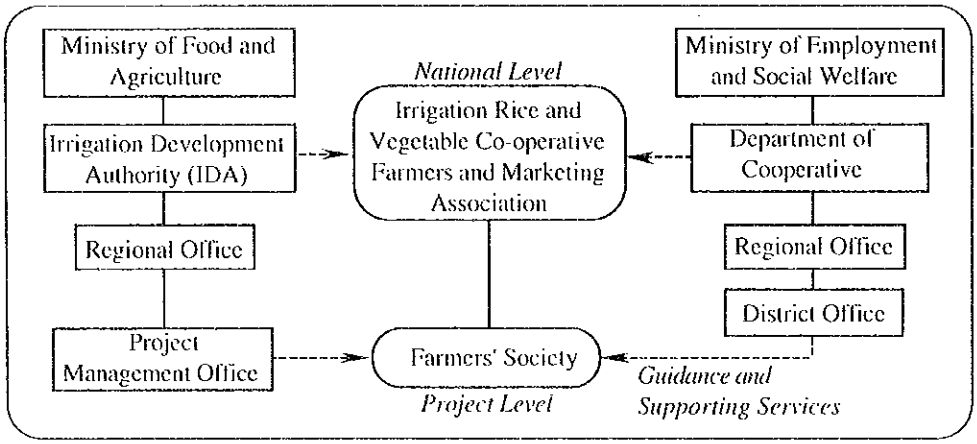
1.1.4 Executing Agencies for Promotion of Farmers' Societies and Handing-over of O&M

(1) Farmers' Societies

Basically, the Department of Co-operatives under the Ministry of Employment and Social Welfare is responsible for promotion and guidance of all co-operative activities in the whole country including GIDA's irrigation project areas. GIDA is also responsible for the

[1] The handing-over of the Dawhenya Irrigation Project has been planned in 1995-1996. This project was rehabilitated by GIDA in co-operation with EC, and the training of the society and GIDA's staff on O&M was carried out by consulting experts despatched by EC from 1991 to 1994.

promotion and support of the societies in O&M, and its front line office is the PM Office. A schematic structure of these services by both agencies is presented below:



In general, inactive supporting services of the Department of Co-operatives are observed in the GIDA's irrigation areas, with the exception of Dawhenya, Weija and Afife. In addition, GIDA has no expert for such services, and both agencies have a weak co-ordination. In case of Dawhenya, Weija and Afife, the District Co-operative Office related to those irrigation areas has despatched a Co-operative Officer to the PM Office in each area, and the services for strengthening of the societies have been provided by them.

In five (5) project areas, no Co-operative Officer is despatched from the District Co-operative Office, and all those services are entrusted to the staff of PM Offices. But their speciality is agriculture and they have no knowledge on such supporting services to the societies.

(2) Project Management and Handing-over of O&M

It is a matter of course that the executing agency for handing-over is GIDA itself. The organisational structure of GIDA is presented in Figure G-2. The Project Management Division under the Department of Project Operations is responsible for promotion of societies, project management and its handing-over of all irrigation areas in the whole country. This Division is however inactive, because only two officers are assigned in this division.

In each irrigation area, the Project Management Office headed by a Project Manager has direct responsibility for O&M of the irrigation facilities and promotion of societies. The PM Office has a very simple organisational structure and has only a few staffs and labourers, except for Weija, Afife and Bontanga. The staffs of each PM Office in the five (5) project areas are shown in the following table.

Number of Staffs in the PM Offices in the Project Areas (As of November 1996)

Projects	Irrigation	Development Area (ha)	Total No. of Staff & Labourers	Organizational Structure
(1) Ashaiman	Gravity	130	4	1- PM (Production Officer), 1-Technical Officer, 1-Water Bailiff, 1-Watchman
(2) Aveyime	Pump/ Gravity	63	6	1- PM (Production Officer), 1-Senior Production Officer, 1-Pump-Attendant, 2-Watchmen, 1-Cleaner
(3) K.-Torkor	Sprinkler	40	3	1- PM (Senior Technical Officer), 1-Pump Attendant, 1-Watchman
(4) Mankessim	Sprinkler	17	5	1- PM (Production Officer), 1-Driver (Mechanic), 1-Pump Attendant (Mechanic), 1-Watchman, 1-Surveyer
(5) Okyereko	Gravity	40	2	1- PM (Production Officer), 1-Labourer
Total		2,130	84	

Source: Project Managers of the PM Offices.

In accordance with the Regulations of IDA (L.I. 1350), 1987, a PM Office has basically the following four (4) committees; (i) Land Allocation Committee, (ii) Agricultural Committee, (iii) Disciplinary Committee, and (iv) Appeals Committee. The functions of each committee are briefly described below:

1) Land Allocation Committee[2]: According to the basic policy of GIDA, all farmlands in the irrigation project areas are allocated permanently to the farmers, and the allocation is implemented by the Land Allocation Committee. The Committee consists of the following 7 members:

   (a) District Secretary (Chairman);
   (b) A representative of the Chief Executive of the Authority;
   (c) The Project Manager (Secretary);
   (d) A representative of the Traditional Council within the area;
   (e) A representative of the District C.D.R.; and
   (f) Two representatives of the farmers' association of the Project.

2) Agricultural Committee: This Committee consists of the representatives of the PM Office and the farmers' society. This Committee is:

   (a) responsible for the planning and implementation of agronomic practices;
   (b) to ensure that no persons tamper with the irrigation network; and
   (c) to ensure that farmers use the land for the purpose specified in the Irrigation Development Authority Land Allocation Agreement (Agreement), and do not transfer or sublet the land allocated to them.

3) Disciplinary Committee: The Committee investigates any infringement or alleged infringement of the terms of the Agreement and imposes appropriate penalties when necessary.

4) Appeals Committee: The Committee considers cases of appeal arising out of the decisions of the Disciplinary Committee.

All these committees have several representatives of farmers who are beneficiaries of the projects, and the projects are managed through these committees. As far as the existing organisational structure of the PM Office is concerned, it can be said that GIDA has introduced a joint management system with farmers for the project management.

(3) Restructuring of GIDA

The Government of Ghana has a plan to privatise of GIDA. In 1993, Parliament enacted a government ordinance[3] on privatisation of 32 national institutions and public corporations including GIDA. In accordance with this ordinance, GIDA prepared a study report[4] on privatisation in November 1995. This report recommends that most part of GIDA remains as an implementing agency for supporting services to the irrigation sector. However, the report includes no definitive and detailed schedule. In addition, MOFA, which is an upper institution

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2 Land allocation means that GIDA gives the cultivation right to the farmers, but the property itself is not handed over to them.

3 Statutory Corporations (Conversion to Companies) Act, 1993 (Act 461).

4 Memorandum from the Irrigation Development Authority on the Proposed Conversion of the Authority to a Limited Liability Company under the Statutory Corporations (Conversion to Companies) Act 1993 (Act 461), GIDA, November 1995.

of GIDA, has also a reorganisation plan[5], and GIDA's privatisation is unsettled on its materialisation so far.

Apart from the above government ordinance, the number of staffs in GIDA has been reduced from year to year. The number of staffs in 1995 was reduced to about one third of the total number in 1985.

Year	No. of Staffs in GIDA
1985	1,116
1988	986
1990	735
1995	377

Note: Including all staff in Head, Regional and PM Offices
Source: GIDA

Annual expenditures of GIDA during the period from 1991 to 1995 are shown in the following table. Total expenditures including recurrent and capital range from 1.4 to 2.0 billion Cedis, and expenditure for maintenance of facilities account for only 3-5% of annual total. The annual total expenditure of GIDA shows a decreasing trend in accordance with the restructuring plan.

Annual Expenditure of GIDA

Description	Expenditure (Million Cedis)					Proportional Extent (%)				
	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
Recurrent Expenditure										
Personal Emolument	423	416	634	945	604	20.7	23.5	56.8	64.2	43.4
Travelling and Transport	105	161	127	130	125	5.1	9.1	11.4	8.8	9.0
General Expenditure	80	89	28	81	125	3.9	5.0	2.5	5.5	9.0
Maintenance and Renewals*	105	78	24	40	53	5.1	4.4	2.2	2.7	3.8
Other Recurrent Expenditure	15	36	20	10	49	0.7	2.0	1.8	0.7	3.5
Sub-Total	728	780	833	1,206	956	35.5	44.0	74.7	81.9	68.7
Capital Expenditure	1,318	987	283	265	435	64.5	56.0	25.3	18.1	31.3
Total	2,046	1,767	1,116	1,471	1,391	100.0	100.0	100.0	100.0	100.0

* Includes maintenance of office machinery, office buildings, grounds and roads, irrigation system, irrigation equipment, plant and equipment, office furniture, and guest house.
Source: GIDA Head Office

1.1.5 Land Allocation

The status of land tenure and land allocation in each project area as of 1996 are summarised as follows, and the details are presented in Table G-3. These information were obtained from the PM Offices and leaders of the existing societies, and confirmed at the fields with the farmers through the public meeting.

Land Tenure and Land Allocation in the Project Areas (1996)

Project Areas		Area (ha)	Status	Allocation
(1) Ashaiman	Existing area	57	GIDA	Allocated
(2) Aveyime	Existing area	63	GIDA	Non
	New Area -1	17	Private	-
	New Area -2	15	GIDA	Non
(3) Kpando-Torkor	Existing area	40	Community	Non
	New Area	146	Community	-
(4) Mankessim	Existing area	29	GIDA	Allocated
	New Area	57	Community	-
(5) Okyereko	Existing area	39	Community	Allocated
	New Area -1	24	Community	-
	New Area -2	18	Community	-

Source: Information obtained from farmers, PM and Regional Offices of GIDA.

The lands hold by GIDA are the existing areas of Ashaiman, Aveyime and Mankessim and new area - 1 of Aveyime. The other lands including existing and new areas belong to vil-

[5] Report of the Task Force Set Up to Make Recommendations for the Decentralisation of the Ministry of Food and Agriculture, MOFA, August 1995.

lage communities, which are governed traditionally by the village chiefs. These lands in the existing areas were developed by GIDA under the agreement with the village chiefs, but GIDA has not yet compensated them

Recently, GIDA has a new policy of the land acquisition which is necessary for project implementation, in accordance with the policy of the handing-over of O&M. Namely, all lands necessary for project implementation should be arranged by the beneficiaries (farmers) and GIDA has no land acquisition, because all lands developed by GIDA are handed over to the beneficiaries with O&M of facilities.

The lands have been allocated to the farmers under the following three (3) irrigation projects; Ashaiman, Mankessim and Okyereko. Under other two (2) projects, the land has been allocated by season, because the PM Offices can not supply enough irrigation water to the areas fixed through the land allocation due to problems of irrigation facilities.

1.1.6 Irrigation Service Charge

GIDA is collecting irrigation service charge from the beneficiaries in all irrigation projects. The unit amount and the collecting situation of irrigation service charge in five (5) project areas in 1996 are summarised as follows, and the details are shown in Table G-4.

Projects	Irrigation Method	Amount of Irrigation Service Fee in 1996 (CD/ha/season)	Collecting Situation in 1994*1 (%)
(1) Ashaiman	Gravity	50,000	12.3
(2) Aveyime	Pump/Gravity	155,000	-
(3) K.-Torkor	Sprinkler	250,000	100.0
(4) Mankessim	Sprinkler	100,000	100.0
(5) Okyereko	Gravity	50,000	50.0 *2

*1 Ratio to total amount to be collected.
*2 Estimated by the Project Manager. No detailed figure is available.
Source: Information obtained from PM Offices and the existing societies.

The unit amount is determined for each project, because the conditions applied in the estimate differ from each other. The highest amount is Cedis 250,000/ha/season (sprinkler irrigation) for the Kpando-Torkor project and the lowest one is Cedis 50,000/ha/season (gravity irrigation) for the Ashaiman and Okyereko projects. Basically, the irrigation services fees include the costs for O&M of irrigation facilities (electric charge, fuel and lubricants, repair cost, parts and replacement cost, etc.), and staff salaries and administrative charge of GIDA are not included.

As for the collecting situation, the Kpando-Torkor and Mankessim projects have collected almost 100% of the irrigation service fees from the farmers. The collecting ratio of the Ashaiman project was only 12.7% in 1994, and the Okyereko project is estimated to be about 50%. With the exception of the Ashaiman project, the fees for all projects have been collected before cropping, and farmers who did not pay charge could not cultivate in the project areas. The collection of the fees for the Ashaiman project has been made after harvesting, and a lot of farmers have refused to pay the fees because of problems of water shortage. The collection ratios in the past five (5) years of this project are presented below:

Payment Situation of Irrigation Service Fees for Ashaiman

Year	Unit Amount (CD/ha/season)	Collecting Ratio (%)
1991	22,500	39.2
1992	22,500	30.4
1993	22,500	21.1
1994	50,000	12.3
1995	50,000	-

Source: Ashaiman and Weija PM offices

An interview survey was carried out on farmers in order to grasp their understanding on the purpose/meaning and amount of the irrigation service charge. The result of the survey shows that almost all farmers have a good and correct understanding of the purpose (see Question Item 16.3 in Table D-1 in Annex-D). Namely, they answered that irrigation service charge is necessary for O&M of the irrigation facilities, and that all farmers who receive irrigation water should pay its charge. As for the amount of irrigation service charge, about 80% of farmers in the whole project areas replied that it is "expensive" to "very expensive" as shown below.

Farmers' Opinion for the Amount of Irrigation Service Fees

	Ashaiman	Aveyime	K.-Torkor	Mankessim	Okyereko	Whole
How do you think about the amount of irrigation service charge ?						
a) Very cheep	-	-	-	-	-	-
b) Cheep	-	13%	7%	-	-	2%
c) Moderate	95%	47%	73%	24%	-	53%
d) Expensive	5%	27%	20%	38%	70%	26%
e) Very expensive	-	13%	-	38%	30%	19%

Source: Farm interview survey by the Study Team.

1.2 Agricultural Support Services

1.2.1 Agricultural Research

Agricultural research activities in Ghana have centralised in national research institutes of the Council for Scientific and Industrial Research (CSIR) under the Ministry of Industry, Science and Technology (MIST). Those main institutions are (i) Crops Research, (ii) Food Research, (iii) Aquatic Biology, (iv) Oil Palm Research, (v) Soil Research, (vi) Water Resources Research, (vii) Cacao Research, (viii) Forest Products Research, and (ix) Renewable Natural Resources. Of these, the research institute related to the irrigation farming is the Crops Research Institute in Kumasi.

As one of the problems on agricultural research in Ghana, it can be pointed out that their research programmes and activities have a poor linkage with needs of farmers and government agencies concerned with agricultural development. For instance, the extension officers of GIDA and the Ministry of Food and Agriculture (MOFA) in and around the project areas have a poor knowledge of irrigation farming practices such as optimum irrigation interval and proper application amount of fertilisers, and on the other hand, almost no research activity on the irrigation farming is observed in such institutions at present. This problem is due to the fact that the CSIR institutes are governed mainly by MIST, and MOFA has a limited say in the formulation of research programmes and research priorities.

In addition to the above CSIR institutes, there is a research institute for irrigation farming called "Irrigation Development Centre (IDC)" in GIDA. This IDC was established in the Ashaiman Irrigation Project area in March 1991 under the financial and technical co-operation of the Japan International Co-operation Agency (JICA). The organisational structure and staffing of IDC are presented in Figure G-3. IDC consists of research and production wings, and has 43 staff in total including one JICA expert and three volunteers (Japan Overseas Co-operation Volunteers) as of November 1996. Main activities of IDC are research and experimental activities on rice, horticulture, soil, farm machinery, water management and agro-environment.

In Ghana, basic research activities on agronomy have been made by CSIR, but applied research activities such as application method of fertilisers and irrigation method are inactive. It is expected that IDC plays a more important role in strengthening of such research activities, especially for improving irrigation farming and O&M of irrigation facilities. In addition, IDC is required to implement training of extension officers and farmers for these irrigation farming and O&M because of no such training facilities in Ghana.

At present, IDC has the following two research programmes under the financial support

of National Agricultural Research Programme (NARP).

1)	Project Title	: The development of an efficient water scheduling programme to ensure continuous cropping on irrigation projects using Ashaiman as a case study
	Objective	: To enhance water use for continuous cropping on the Ashaiman Irrigation Project
	Project Period	: 3 years (1996-1998)
2)	Project Title	: Agro-forestry systems for sustainable land use in the catchment area of Irrigation Projects, using Ashaiman as a case study
	Objective	: To promote sustainable land use and to increase incomes of farmers in the catchment areas of GIDA projects using agro-forestry systems to produce fruits, fuelwood and electric poles.
	Project Period	: 5 years (1996-2000)

The main facilities and equipment hold by IDC at present are listed below. Most of vehicles and equipment were provided by JICA, and all buildings were constructed by GIDA.

Main Facilities and Equipment of IDC (1996)

Items	No.	m2	Items	No.	m2
Buildings			Farm machinery and equipment		
Administration office	1	65	2-Wheel Tractor	5	
Research building			Farm Equipment (Sprayers, Winnowers, etc.)		
Soils	1	144	Rice Mill	1	
Horticulture	1	61	Vehicles		
Rice	1	139	Mini Bus	1	
Agro-environment	1	59	4WD	1	
Repairshop	1	223	Pick-up	2	
Accommodation	1	59	Sedan	1	
Quater for JOCV	1	149	Motorcycle	7	
Store	2	57	Fields		
Store (Agro-machinery)	1	114	Experimental field for rice		0.4 ha
Weather station	1		Seed production farm for rice		0.6 ha
Laboratory instruments	*		Experimental field for upland crops		**

Source: IDC

* Various laboratory instruments were provided by JICA.
** Less than 2 ha (not fixed)

1.2.2 Agricultural Extension and Seed Supply

(1) Agricultural Extension of MOFA

MOFA is responsible for agricultural extension to farmers. Figure G-4 shows the organisational structure of extension services by MOFA at the district level. There are following four basic offices for extension activities in each district. In addition to the above, a veterinary office and a fishery office also exist in those active districts.

(a) Agricultural Extension Services
(b) Crop Services
(c) Plant Protection and Regulating Services (PPRS)
(d) Policy Planning, Monitoring and Evaluation Department (PPMED)

Of these, the Agricultural Extension Services office has direct links with farmers, and disseminates new farming technology and information to them. The extension method adopted by this office is T&V (Training and Visit) system. Each district is divided into 14-15 operational areas and an operational area has 15-20 contact groups which consist of 8-15 farmers per group. Each operational area is assigned one technical officer. MOFA's extension activities are concentrating on staple foods (maize, cassava, yam, cowpea, soybeans) in rainfed areas, and it provides almost no services to GIDA's irrigation project areas.

(2) Agricultural Extension of GIDA

In the irrigation areas, GIDA is responsible for agricultural extension services to

farmers. The present extension activities and staffing of GIDA are presented in Table G-5. In general, each project has one to five extension officers. As the present problems of GIDA's extension services, the following three (3) matters may be pointed out; (i) poor knowledge of staff on irrigation farming, (ii) lack of vehicles/motorcycles to make mobile services, and (iii) no extension facilities and equipment such as printing equipment and overhead projector (OHP). In addition, a weak co-ordination between the Project Management (PM) offices and MOFA's extension offices is observed.

(3) FAO Training Programme for Extension of Irrigation Farming

MOFA and GIDA have a strengthening project of the extension system for irrigation farming under the technical and financial co-operation of FAO. It is the "Development of Support Structure for Irrigated Agriculture," and the executing agencies of the project are GIDA and the Department of Agriculture Extension Services (DAES).

The objectives of the project are (i) to develop support structure for irrigated agriculture, particularly effective irrigation extension services, and (ii) to make recommendations aiming at helping the Government in formulating sound policies to promote irrigation management transfer to farmers and to develop a sustainable irrigated agriculture.

The expected outputs of the project are as follows:

- A consolidated approach and methodology for the establishment of an effective irrigation service.
- A consolidated training programme and training approach to adequately prepare relevant staff to provide an effective support to farmers in irrigated agriculture.
- Key staff in the Departments of Irrigation, Agricultural Production and Extension trained to effectively assist farmers in a viable and sustainable irrigated farming system.
- An evaluation of the role and functions of GIDA and DAES in supporting farmers and the institutional frame work required to improve the performance of the irrigation sector.

This project is just commenced in July 1996, and the project staffs are now preparing for the implementing schedule, curriculum on training, and so on. The following training courses are scheduled to implement from November 1996 to May 1998.

FAO Training Courses and Schedule

1) Irrigation Extension Staff Training	
- 13 - 24 January 1997	Preparatory Training Irrigation Extension Staff
- 24 February - 1 March 1997	First Seasonal Training Irrigation Extension Staff
- May 1997	First Technical Training Irrigation Extension Staff
- 8 - 26 September 1997	Second Seasonal Training Irrigation Extension Staff
- November/December 1997	Second Technical Training Irrigation Extension Staff
- 16 - 28 March 1998	Third Seasonal Training Irrigation Extension Staff
2) Training of Trainers	
- 6 - 8 November 1996	Preparatory Trainers Consultation
- 9 - 10 December 1996	Second Trainers Consultation
- 28 - 29 April 1997	Technical Trainers Consultation
- 18 - 20 August 1997	Seasonal Trainers Consultation
- 17 - 18 November 1997	Technical Trainers Consultation
- 2 - 3 March 1998	Final Trainers Consultation
3) Training of Farmers	
- 3 March - 10 April 1997	First Seasonal Farmers Training
- May - July 1997	First Technical Farmers Training
- 1 October - 15 November 1998	Second Seasonal Farmers Training
- December 1997 - February 1998	Second Technical Farmers Training
- 1 April - 10 May 1998	Third Seasonal Farmers Training

Source: GIDA Head Office

In addition, this strengthening project of the extension system has a plan for the national workshop aiming at the following specific outcomes:

- assisting the Government in the formation of national irrigation policy.
- providing conditions for the extension of the pilot programme at a regional and national level, and specific proposals for its adoption by the outgoing irrigation investment programmes.

(4) Seed Supply

As for the seed supply, most of farmers obtain seeds from markets or other farmers or use products harvested in the last season, except for maize and tomatoes. Those original seeds are supplied by private companies (AGLOW, WEINCO, etc.) as well as fertilisers and agrochemicals. The Government (MOFA and GIDA) supplies only new varieties of seeds. The present seed supply situation is estimated as follows, based on the farm interview survey.

Seed Supply for Main Crops Grown in the Project Areas

(Unit: %)

	Cassava	Maize	Rice	E. Plant	Okra	Onions*2	H. Pepper	Tomatoes
a) Government agency*1	3	26	13	-	2	-	-	30
b) From extension workers	-	6	1	-	-	-	-	2
c) Purchased at market	8	20	6	15	35	-	27	14
d) From other farmers	39	17	28	30	48	100	27	21
e) Purchased from dealers	3	13	1	11	3	-	7	14
f) Own seed*3	44	18	50	44	13	-	40	19
g) Others	3	-	1	-	-	-	-	-

*1 Including seeds obtained through GIDA's PM Offices.
*2 Farmers obtain onion seeds directly from the norther part (Upper East Region) of the country.
*3 From the last harvest.
Note: Figures indicate the average percentage of total samples (180 farmers) of the farm interview survey.
Source: Farm interview survey by the Study Team.

The result of farm interview survey indicates that there is almost no problem of seed supply in all project areas (Question Item 12.2 (10) in Table D-1 in Annex-D). It seems that farmers have no difficulty in obtaining seeds in sufficient quantity. In order to improve crop yields and quality of products, however it will be necessary to improve the present government supply system for introducing new varieties.

1.2.3 Agricultural Credits

The result of farm interview survey on problems relating to the present farming situation shows that about 80% of total samples have pointed out "credit facility" and 70% have desired its improvement (see Question Items 12.2 and 12.3 in Table D-1 in Annex-D). In all the project areas, 40% of farmers have borrowed loans for purchasing farm inputs and hiring farm machinery, and of these loans, 57% have been obtained from middlemen for farm products and 17% from banks (see Question Items 14.1 and 14.3 in Table D-1 in Annex-D).

(1) Bank Loans

The following three (3) banks are extending for agricultural credits; (i) Agricultural Development Bank (ADB), (ii) Co-operative Bank, and (iii) Rural Bank. Of these, ADB is common for individual farmers. Others are for loans to co-operatives (including GIDA's societies) and rural industries including agro-processing. The loan amount is decided individually according to the following borrower's conditions; (i) security, (ii) borrower's bank account and deposit amount, and (iii) grantee by authorised institutions/organisations/companies. As for security for loans, the banks request valuable properties such as houses and machinery, and lands are not evaluated.

The banks are now hesitating to extend loans to farmers because of their low repayment capability with recent inflation in the country. According to ADB in Tamale, a lot of farmers have defaulted in payment of loans. The loan interest is now rising rapidly in accordance with the recent inflation of prices of commodities, as shown below.

Movement of ADB Loan Interest to Smallholders	
January 1995	26 %/year
May 1995	31 %/year
September1995	38 %/year
ADB Loan Interest by Category (as of Nov.1995)	
Smallholder (Agric.)	38 %/year
Forestry	40-45 %/year
Export Trade	45-48 %/year
Manufacturing	46-50 %/year
Construction	46-50 %/year
Commerce	48-52 %/year
Others including personal loan	46 %/year

Source: ADB Tamale

(2) Loans from Middlemen

At present, farmers are obtaining loans from private middlemen (market mummy) for products. As of December 1995, their interest rate was very high estimated at 50-100% per season, except for Ashaiman. The interest rate charged by middlemen in the Ashaiman area was less than 20% per season. There are two methods of repayment of loans; "by cash" and "in kind," and a half of borrowers have paid loans by cash. In the case of payment in kind, the middleman purchases the borrower's products under favourable conditions, and in this case, an actual interest rate become over 50-100%.

2. CONSTRAINTS TO INSTITUTIONAL DEVELOPMENT

Through the field investigation and analysis of data and information collected from various institutions, field investigations and farmers, the following constraints and problems were identified:

1) The final target of the Project is to improve farmers' living standards through the introduction of proper irrigation farming. In order to achieve this final target of the Project, the agricultural support services are crucial factor. In the project areas, however, the PM Offices have a weak co-ordination with the agencies related to the agricultural support services, especially with the agricultural extension offices of MOFA.

2) A farmers' society has been established in each project area. According to present bye-laws, all these societies are general agricultural co-operatives which aim to promote the economic interests of their members, and there is no article on the O&M of irrigation facilities in their bye-laws. In the case of the water users' association, it is necessary to enact specific articles in the bye-laws such as the right of collection of irrigation service charge and application of sanctions to the members who use irrigation water illegally. To form a legal basis, it is also necessary to enact some laws at the national level.

3) The strengthening of the existing societies is a prerequisite factor for the successful handing-over of O&M, but GIDA itself has no function of promoting societies. All such promoting services have been entrusted to the Department of Co-operatives, but this department has almost no experience in providing support services to the water users' association. In addition, a weak co-ordination between the Department of Co-operatives and GIDA at site has been observed.

4) GIDA has a weak organisation and staffing as the executing agency for the handing-over of O&M, as well as for the promoting services to the societies. The Project Management Division under the Department of Project Operations is responsible for the handing-over, and its direct implementation is undertaken by the PM Offices. The Project Management Division has only two officers. In addition, the front line staff of the PM Offices has insufficient experience in the handing-over of O&M. These offices should therefore be strengthened before the implementation of the handing-over programme.

5) A lot of farmers desire to have credit facilities for their farming. The farmers in the project areas have narrow access to the bank loans. Although several commercial banks are available around their villages, an interest of agricultural credits supplied by the commercial bank raise up over the repayment capacity of the farmers who have a poor income from their farming. Moreover, they have no or a little valuable properties as security for loans.

Each of these constraints dose not affects the present inactive institutional and agricultural support services in the project areas, but relates closely each other. The proposed development plans and strengthening of agricultural support services should be formulated taking the above constraints into account.

3. INSTITUTIONAL DEVELOPMENT PLAN

3.1 Basic Concept for Institutional Development

The objectives of the institutional development plan are to ensure successful and sustainable O&M of irrigation facilities by the farmers themselves and improve farmers' crop production through the strengthening of agricultural support services. The major concepts to achieve these objectives are as follows:

1) Prior to the handing-over of O&M, GIDA should be strengthened to fulfil the tasks of an executing agency. For this purpose, staffs who take charge of implementing handing-over of O&M and providing support services to the farmers should be strengthened.

2) The O&M management and supporting systems of GIDA should be simplified so that the related activities can be carried out efficiently and smoothly.

3) The handing-over period should be set up for the Project, taking into account the actual situation of the societies' activities, farmers' ability and the experience of GIDA's front line staff.

4) Successful and sustainable O&M by the farmers needs a lot of support services from the various agencies concerned. The institutional plan should therefore cover the improvement and co-ordination of all these activities involved in O&M.

5) In order to ensure sustainable O&M by the farmers, an approach involving farmers' participation should be adopted in the handing-over plan, with the establishment of a monitoring system in the executing agency.

6) The strengthening of agricultural support services such as marketing and credits as well as the rehabilitation of irrigation facilities is also a prerequisite factor. These support services should also be strengthened in order to achieve the final target of the Project.

7) The O&M by the farmers should be realistic and possible in financial viewpoint. Therefore, the O&M cost should be minimised.

8) In order to arouse the farmers' sense of ownership and responsibility in the O&M of facilities, all lands in the project areas should be allocated permanently to the farmers, in accordance with L.I. 1350 of GIDA and the traditional customs of land holding in the country.

3.2 Improvement Plan for Executing Agency

3.2.1 Organisation of Project Executing Agencies

The implementation of the Project is divided into three stages; (i) rehabilitation works, (ii) handing-over of O&M, and (iii) O&M by the farmers. The organisation of executing agencies for the stages (i) and (ii) is proposed as follows, and that for the stage (iii) is described in Section 3.3.

(1) Executing Agency for Rehabilitation Works

GIDA under MOFA will be the executing agency for the rehabilitation of irrigation projects. GIDA will co-ordinate all activities of the relevant government agencies and regional administrative organisations in connection with the project implementation. The Department of

Project Development under GIDA will have direct responsibility for the project implementation including both the engineering and the construction works. The Regional and PM Offices will manage and co-ordinate the construction of the Project at the district level on behalf of the Department of Project Development. The main tasks of these offices will be as follows:

1) Financial arrangements needed for the engineering and construction works of the Project;
2) Design and construction supervision of all the works;
3) Co-ordination between the government authorities concerned with the implementation of the Project;
4) Arrangements for staff required during the detailed design and construction stages; (The head office of GIDA should despatch at least one civil engineer to each PM Office for supervising of construction works.)
5) Progress and quality controls of the rehabilitation (construction) works; and
6) Preparation of O&M manual.

(2) Executing Agency for Handing-over of O&M

After completion of the rehabilitation works, all project facilities will be transferred to the Department of Project Operations under GIDA, which will be responsible for the handing-over of O&M to the farmers' societies. The PM Offices will have direct responsibility for the handing-over at the project site under the management and instruction of the Department of Project Operations. The organisation of these two offices should be strengthened in order to ensure successful implementation of the handing-over. The proposed organisational structure and staffing of both offices with supporting agencies involved in O&M are presented in Table G-6 and Figure G-5 and briefly described below:

1) Department of Project Operations

The proposed organisation consists of three divisions; (i) O&M Division, (ii) Monitoring and Evaluation Division, and (iii) Extension Division (see Figure G-5). The O&M Division comprises five officers; an irrigation engineer, a civil engineer, a mechanical engineer and a mechanic under a deputy director. This Division undertakes the following activities:

- Overall engineering services for O&M through the PM offices,
- Training of the staffs of the PM Offices and societies on O&M,
- Improvement and dissemination of water management practices,
- Movable services for pumps and equipment of the societies, etc.

The Monitoring and Evaluation Division monitors all project activities, and the Extension Division undertakes agricultural extension activities. These activities are described in Sub-section 3.2.2 (2) and Sub-section 3.4.1, respectively.

2) PM Offices

Two types of organisations and staffing are proposed in accordance with the development stages; (i) O&M during the transitional period until the handing-over, and (ii) O&M by the farmers' society after handing-over (see Figure G-5). The main tasks of the PM Offices are summarised below.

(a) Transitional Period

O&M Officer
- Joint O&M of facilities with the farmers' society
- Training on O&M
- Handing-over of O&M, etc.

Extension Officer
- Agricultural extension services
- Administrative services to the farmers' society

Co-operative Officer
- Necessary arrangements for establishment of an agricultural co-ordinating committee
- Strengthening and training of the farmers' society
- Improvement of marketing and agricultural credits, and promotion of women's activities, etc.

Monitor
- Monitoring works, etc.

(b) After Handing-over of O&M

O&M Officer
- Technical guidance of the society on O&M
- Follow-up training on O&M
- Machinery services for O&M by the society

Extension Officer
- Agricultural extension services
- Support and follow-up services for marketing, credits, women's activities, etc.

Monitor
- Monitoring works, etc.

In addition to the above strengthening and reorganisation programmes, it is proposed to establish the following committees to ensure the successful implementation of rehabilitation works and handing-over of O&M.

1) Establishment of the Project Implementation Committee

It is recommended to establish a Project Implementation Committee in the GIDA's head office during the period of rehabilitation works and transition of O&M. The members of the Committee will consist of a Chief Executive, a Deputy Chief Executive, and Directors of Departments and IDC in GIDA. All activities relating to the rehabilitation works and handing-over of O&M will be monitored, and the problems and constraints identified through this monitoring will be settled immediately by the Committee.

2) Agricultural Co-ordinating Committee

In order to keep a close co-ordination between the agencies related to the agricultural support services, it is proposed to establish an Agricultural Co-ordinating Committee in each project area. The membership of the Committee will consist of the representatives of the following agencies: (i) Regional Agricultural Director (chairman); (ii) Farmers' Society in the project area; (iii) PM Office of the Project; (iv) District offices of Agricultural Extension Services (PPMED, PPRS and Crop Services); (v) District office of the Department of Co-operatives; (vi) Banks; and (vii) NGO. The Department of Project Operations under GIDA will make necessary arrangements to establish this committee and provide technical backstop.

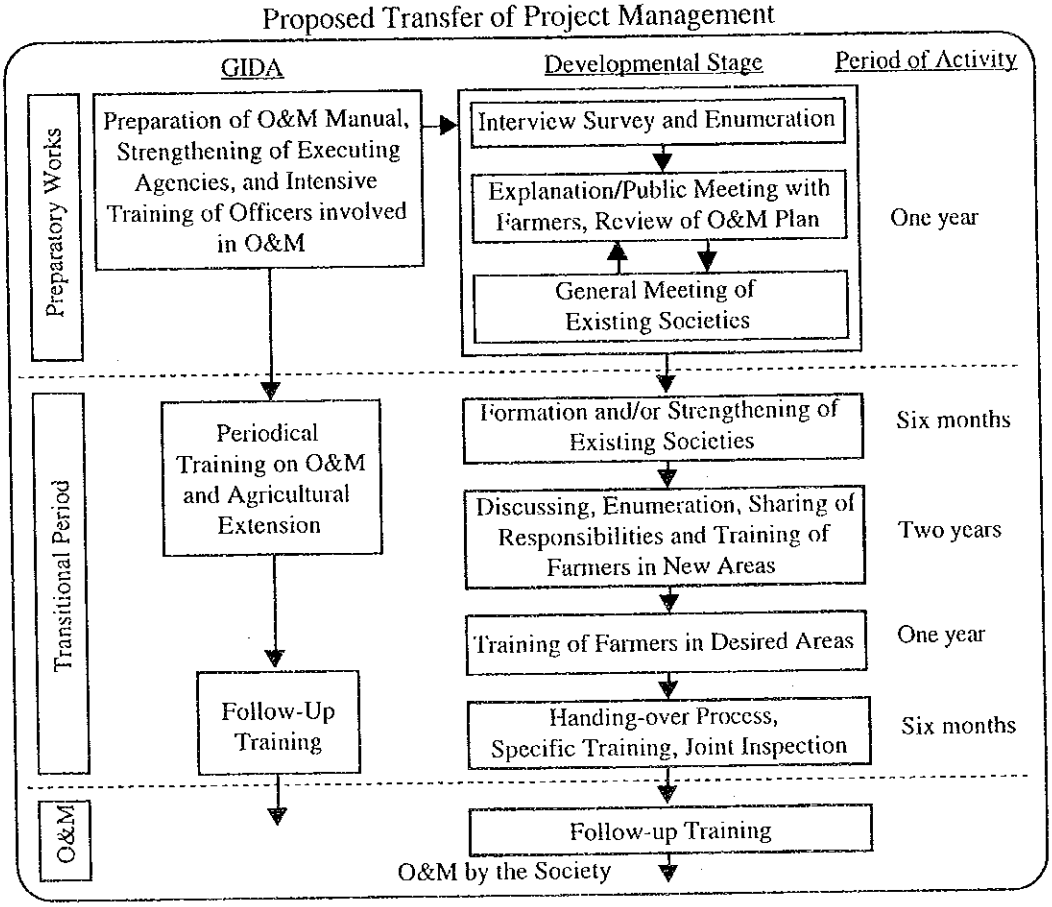
3.2.2 Project Implementation and Management by GIDA

(1) Handing-over of O&M

At present, GIDA has a plan for the handing-over process. In this plan, the handing-over period has been set at three (3) years. Although the contents of this plan can be adopted

basically to the Project without problems (see Table G-2), the period should be set up, taking into account the actual situations of societies' activities, farmers' ability and the experience of GIDA's front line staff who directly implement the handing-over. As a reasonable period, it is proposed to set basically five (5) years, based on the result of field investigation and referring to the progress of the Dawhenya Irrigation Project[1]. It will however be possible to hand over O&M to societies within five (5) years, if those societies have a good progress for training programme. The proposed handing-over process is shown below.

Proposed Transfer of Project Management



In addition to the above handing-over process, the following matters are recommended from the standpoint of farmers' participation in the Project.

1) Farm Interview Survey

Before the detailed design, an interview survey of the farmers in the project areas should be carried out by the PM Offices, in order to grasp the farmers' intention as to the agricultural development and handing-over of O&M. Based on the result of this survey, the plan for rehabilitation and handing-over will be reviewed by GIDA.

2) Explanation Meeting (Public Meeting) with Farmers

Based on the result of farm interview survey and review, an explanation meeting with beneficiaries will be held at each project site by GIDA in co-operation with the Department of Co-operatives. Attendants of this meeting are all beneficiaries, leaders of existing farmers' society and GIDA's offices involved in handing-over of

[1] The training programme about O&M to the farmers' society was implemented by the consulting experts during the 4 years from 1991 to 1994.

O&M. The contents of the meeting are as follows:

- Details of the rehabilitation project and O&M by the farmers' society
- Necessity of O&M by the societies and its merit and demerits
- Duties of farmers' society and GIDA
- Necessity of irrigation service charge and its proposed collecting system
- Enactment of articles and bye-laws on O&M
- Contents of the Government's support services and training programmes to be provided to the farmers
- Schedule of handing-over and land allocation

Through the explanation meeting, GIDA will have full understanding of the farmers about the implementation of the rehabilitation projects and handing-over plan.

3) General Meeting of Farmers' Society

After the explanation meeting, a general meeting of the existing farmers' society should be held, and all the items mentioned above will be acknowledged officially by the society and farmers. Then the rehabilitation project will be authorised by both parties, GIDA and the society. The PM Office should provide necessary guidance to the society for holding this meeting.

4) Joint Inspection of the Facilities

Prior to the handing-over of O&M, it is recommended to carry out a joint inspection by GIDA and the farmers' society. All facilities to be handed over should be inspected by both parties, and then these facilities will be transferred to the society without problems and claims from the farmers.

(2) Management of Irrigation Facilities

Basically, all of the facilities rehabilitated by the Project are handed over to the farmers societies, and managed and maintained by themselves. The proposed pumps in Aveyime, Mankessim and Okyereko projects are fixed type which is prevalent among the country, and the power source of these pumps is electric motor which is easy of operation and maintenance more than diesel engine. The farmers can operate these pumps without problems. As for the Kpando-Torkor project, the floating type was proposed, taking into account the fluctuation of water level. The operation of this type is not so difficult, because the pump itself is fixed type and the power is electric motor as well as other projects. However, the farmers are not familiar with such type. Therefore, it is recommended that these pumps in Kpando-Torkor project are operated by the PM Office, and the farmers operate and maintain the sprinkler irrigation systems below the pump stations. After the transitional period of 5 years, if the farmers could operate this floating type pump, GIDA will hand over the pump station to them.

Projects	Irrigated Areas (ha)	No. of Intake/ Pump Station (No.)	Irrigation Method	O&M
Ashaiman*	54	1	Reservoir Gravity irrigation	Farmers
Aveyime	95	1	Intake by pump from the Volta river Gravity irrigation (80ha) Pump and furrow irrigation (15ha)	Farmers
K-Torkor	70 85	1 1	Intake by pump from the Volta lake Sprinkler irrigation	PM Office : 2 pump stations Farmers : Below pump stations
Mankessim	29 57	1 1	Reservoir Sprinkler irrigation	Farmers
Okyereko	81	1	Reservoir Intake by pump from the Volta river Gravity irrigation (81ha)	Farmers

* Total irrigated area in the Ashaiman is 56 ha. Out of total area, 2 ha are occupied by IDC for experimental fields, and remaining 54 ha are provided to the farmers.

(3) Land Allocation

All lands in the irrigation project areas are allocated to the farmers, in accordance with L.I. 1350 and traditional customs of land holding in the country. The land allocation procedure is as follows; (i) land acquisition by GIDA, (ii) establishment of the Land Allocation Committee, and (iii) land allocation to the farmers by the Committee.

In land allocation, the Committee gives priority to the following farmers: (i) those who have been displaced as a result of the construction of the Project; (ii) those who are resident in the surrounding villages; or (iii) those who are resident in other villages and wish to settle near the Project and accept small holdings. As for the plot area to be allocated to a farmer, GIDA will suggests the optimum area based on the farm budget analysis and the labour balance study, but the final decision will be by the Land Allocation Committee.

(4) Training Programme for O&M and Strengthening of the Farmers' Society

Prior to the handing-over of O&M, the existing societies should be strengthened through a forced training programme. For this purpose, a wide scale training programme will be introduced. Namely, the training programme will be implemented not only for the farmers in the project areas and the officers of GIDA, but also for the officers involved in O&M and the people including the district offices of the Department of Co-operatives, the extension offices of MOFA, village chiefs and elder groups in villages, because the O&M by the society needs a lot of co-operation and support from them.

The O&M Division and the Extension Division will be responsible for conducting the training. The training programme is divided into five (5) courses depending on the training contents and the trainee's educational background, i.e., Course-A, -B, -C, -D and -E. The details are shown in Table G-7. The Course-A is for senior officers of GIDA and other agencies involved in O&M; the Course-B is for officers of the PM Offices and the head office of GIDA; and the Course-C is for farmers' groups including leaders of the societies, gate operators, pump attendants, farmers, etc. The courses-D and -E will be provided only to the officers of other agencies and the people in the village. The training contents will consist of O&M and strengthening of the society, but some other topics such as new agricultural extension system and promotion of the women in development will also be included in this training programme, because the officers and the people involved in the O&M and strengthening of the society should have the basic knowledge of these matters.

Lectures are conducted visually by the use of overhead projector, TV, etc., and the training should be implemented periodically during the transitional period. After handing-over of O&M, follow-up training on specific items will be provided occasionally to the above officers and people. It is proposed that the Courses-A, -B and -D be conducted at both project site and IDC, and the Courses-C and -E will be mainly given at the project site.

(5) Establishment of a Monitoring System

To sustain O&M by the farmers' society, and to make further improvement of O&M and agricultural production after handing-over, it is proposed to establish a monitoring system in GIDA. The monitoring items necessary for these purposes are listed below.

1) Meteorological data including rainfall, temperature, evaporation, humidity, etc.
2) Water management
   - Data on water level and discharge of the relevant reservoirs and rivers
   - Records of daily discharge from the water sources
   - Data on planted crops and cropped area under irrigated condition

- Data on conveyance losses of canals
- Records of pump operation hours
- Records of spilling times

3) Operation and maintenance of the facilities

- Reports of periodic inspections
- Reports of damages of project facilities
- Records of repairing of facilities
- Records of operation costs
- Records of regular, periodic and annual maintenance, and emergency repairs

4) Farmers' society

- Data on irrigation service charge
- Annual appraisal reports on financial status

5) Agricultural production and farmer's economy

As for the monitoring of agricultural production and farmer's economy, it is recommended to carry out the "Bench Mark Survey (BMS)" method. This BMS consists of a detailed survey and a seasonal survey as outlined below:

1) Detailed BMS		
a) Period of survey	:	Befor constrcution and three years interval after construction
b) Survey items	-	Size of household, land holding size and land tenure
	-	Cropped area, production, crop damage and production cost
	-	Farm inputs and labour requirement
	-	Social infrastructure and living situation
	-	Livestock raising and holding of farm machinery and equipment
	-	Marketing of products and seeds
	-	Off-farm income, living expenses, credits and loan repayment
	-	Irrigation water supply and O&M of irrigation facilities
	-	Farmers' intention for improvement of farming and farmer's association
	-	Farmers' intention for O&M and its handing over to the beneficiaries, etc.
2) Sesonal BMS		
a) Period of survey	:	To each cropping season
b) Survey items	-	Cropped area, production, crop damage and production cost
	-	Farm inputs and labour requirement
	-	Marketing of products and seeds
	-	Off-farm income, living expenses, credits and loan repayment
	-	Irrigation water supply and O&M of irrigation facilities

It is proposed to reorganise the existing Monitoring and Evaluation Division in the Office of Planning and Management or to establish a new Division in the Department of Project Operations (see Figures G-2 and G-5) to take charge of these monitoring works. The O&M of this monitoring system will be undertaken by this Division, and will be linked closely with IDC. The PM Offices will have a direct responsibility for field survey and observation of the above monitoring items. In each PM Office, a monitor is appointed to manage monitoring works in the field (see Figure G-5). These PM Offices are now preparing the following four documents; (i) monthly report, (ii) quarterly report, (iii) mid-year report, and (iv) annual report. All data should be reported in these documents, and processed by the Monitoring and Evaluation Division and IDC by the use of computers. The data will be fed back to improve O&M and agricultural production in the project areas. The evaluation and assessment of the project effects and environmental protection will also be studied based on these data. The monitoring manual including forms necessary for recording data will be prepared along with the O&M manual at the detailed design stage.

3.3 Farmers' Society

As the basic approach, the O&M should be handed over to the societies which have al-

ready been established in each project area, and it is not considered to establish any newly society, but only to reorganise the existing ones, if necessary. The strengthening of the existing societies should be undertaken by GIDA, in co-operation with the Department of Co-operatives. The proposed strengthening plan for the existing farmers' societies is described below:

(1) Objectives of Farmers' Society

The main objective of a farmers' society is to operate and maintain the irrigation facilities. In addition, other objectives such as marketing and credit services are also included in order to meet with the farmers' intention and to improve present agricultural support services. The result of interview survey indicates that many farmers have requested such agricultural support services by the farmers' society (see Question Item Q-18 in Table D-1 in Annex-D).

(2) Organisation and Activities

At present, a farmers' society has been established in each project area, but all these societies have no function of O&M of the irrigation facilities. These existing societies should therefore be reorganised to new societies which have the functions of O&M with the agricultural support services such as marketing and credits. The proposed organisation consists of Type-A and -B. Both types have almost the same structure, and the difference between the two types is as follows:

1) Type-A is for small projects having less than 100 farmers, and the farmers are linked directly with the committee of management.

2) Type-B is for larger projects with over 100 farmers. In this type, the farmers are divided into several groups by each irrigation block, and each group is linked separately with the committee of management. Each farmers' group elects a representative who is the member of the committee.

The adoption of these types is entrusted to the society. But it is recommended that the size of a farmers' group should be less than 100 farmers, so that one of the prime requirements to activate society is "face to face" communication between the committee of management and the farmers.

The proposed organisational structure of each project is presented in Figure G-6. The society consists of the following four (4) components; (i) general meeting, (ii) committee of management, (iii) audit, and (iv) service sections (sub-committees) including O&M, agriculture, marketing and credit, and women's group. In addition, irrigation groups are formed under the committee of management. Their main functions and activities are as follows:

1) General Meeting

The general meeting is held at least annually, and has the following main activities:

- Election of the committee's members and auditors,
- Acknowledgement of the result of auditing,
- Acknowledgement of the annual management plan and budget,
- Determination of the amount of irrigation service charge,
- Revision of the irrigation service charge,
- Revision and enactment of articles and bye-laws,
- Specific items requested by the members and committees, etc.

2) Committee of Management

The committee of management is composed of the following members; chairman, vice chairman, general secretary, treasurer, and several members who are represen-

tatives of the service sections. In the case of Type-B, several representatives of the farmers' groups are included as committee members. In addition, one or several porters, who are volunteers, are appointed in the committee in order to maintain close communication among the members and between the committee and the farmers. The main tasks of the committee are (i) to prepare annual management plans and budget, (ii) to instruct and supervise activities which are implemented by the service sections, (iii) to manage complaints and grievances from the farmers, (iv) to arrange and appoint volunteers to work in the service sections, (v) to manage accounting and general affairs, (vi) to co-ordinate with other agencies and associations, and so on. The committee members take charge of parts or portions of these works. Regular meetings are held monthly for implementing these activities.

3) Service Sections

Under the instruction and supervision of the committee of management, the routing service works are implemented by the following four sections; (i) O&M, (ii) agriculture, (iii) marketing and credit, and (iv) women's group. These sections employ several volunteers, and their main activities are as follows:

(a) O&M Section

- Preparation of irrigation schedule,
- O&M of irrigation facilities,
- Estimate of irrigation service charge,
- Management of communal works such as canal clearing and maintenance of farm roads, and
- Security service for irrigation facilities, etc.

(b) Agricultural Section

- Transmission and notification of information on extension implemented by the PM Office,
- Arrangement of farmers' meeting on agricultural extension,
- Providing machinery services, and
- Promotion, arrangements and leading for group farming such as co-operative control of pests and diseases, transplanting and harvesting, etc.

(c) Marketing and Credit Section

- Implementation of co-operative purchasing and shipping,
- Arrangements for storing of farm inputs and products,
- Agricultural credit services, and
- Exploitation of new marketing channels, etc.

(d) Women's Group

- Promotion for women's agri-business and cottage industry,
- Promotion for homestead development,
- Improvement of social welfare and health care of the farmers, and
- Education on home economy and management, etc.

4) Audit Section

At present, the staff of an society consists of a chairman, a vice chairman, a secretary, a treasurer and several members of the committee as mentioned earlier, but generally no auditor is assigned. In other words, the society has no auditing system in its accounting operation, and this is one of the society's problems. To solve this problem, it is proposed to establish an auditing system.

5) Irrigation Groups

An irrigation group is formed by each lateral canal for gravity irrigation and each rotational block for sprinkler irrigation, in order to make smooth water management Each group operates the facilities within the irrigation block divided by those lateral canal or one unit of sprinkler irrigation system. A group selects a leader, and links with the society through this leader.

The number of members constituting the committee of management and service sections are estimated in the following table. The farmers' society is managed and operated by them who are volunteers selected from the farmers, and has no full-time official. The payment of their allowances for the society's jobs are decided by the farmers.

Committee od Management	Member	Assistant
Chairman	1	-
Voice Chairman	1	-
General Secretary	1	1-2
Treasurer	1	1
Member	4-6	-
Service Section	In Charge	Assistant
O&M	(1)*	-
Pump/Gate Operator	1	2-3
Agriculture	(1)*	1-2
Marketing & Credit	(1)*	2-3
Women' Group	(1)*	1-2
Auditor	2	1

* Additional post of the committee members

(3) Number of the Farmers' Societies

The number of the farmers' societies to be established in the project areas is as follows:

Number of Farmers' Societies to be Established in the Project Areas

Projects	Irri-gated Areas (ha)	Holding Size of Farmer (ha)	No. of Farm-ers (No.)	No. of Intake/ Pump Station (No.)	No. of Soci-ety (No.)	No. of Farmers' Groups (No.)	Irriga-tion Groups (No.)	Remarks
Ashaiman*	54	0.45	120	1	1	-	13	- Form an irrigation group by each lateral canal.
Aveyime	95	1.0	95	1	1	-	4	- There are three main canals and one pump station below main pump station at the Volta river. An irrigation group is formed by each canal and pump station.
K-Torkor	70 85	0.4 0.4	175 213	1 1	1 1	2 2	29 35	- The project area is divided into two blocks. Each block has one pump station, and the water management is carried out separately. It is proposed to established the society in each block. - Form an irrigation group by each sprinkler irrigation unit (2.4ha).
Mankessim	29 57	0.4 0.4	73 143	1 1	1 1	- 2	12 24	- This area consists of two blocks; 29 ha of existing area and 57 ha of new area. The society is established in each block. - An irrigation group is formed by each sprinkler irrigation unit (2.4 ha).
Okyereko	81	0.6	135	1	1	-	17	- The existing society which consists of 68 farmers is in perfect union. Although the number of farmers after the project will over 100, it is proposed that no farmers' group is established under the society. - An irrigation group is established by each lateral canal.
Total	471	0.49	954	7	7		134	

* Total irrigated area in the Ashaiman is 56 ha. Out of total area, 2 ha are occupied by IDC for experimental fields, and remaining 54 ha are provided to the farmers.

In the Kpando-Torkor and Mankessim projects, there are two pump stations, and these water management is carried out separately. Therefore, the society is established by each pump station. For the maintenance of access roads from the project area to the main roads, a co-ordination committee is established between them.

(4) Office and Facilities

An office of the society shares the floor space in the PM Office. All necessary administrative works including typing, printing, photocopying, communication, etc. should be supported by the PM Office.

(5) Training of Farmers' Society

The PM Office prepares training programmes and trains periodically the leaders of the farmers' society and the farmers themselves, in co-operation with the Department of Co-operatives. In order to solve the problems and constraints encountered during the transitional period of O&M, the PM Office should monitor intensively all the society's activities. The training items required for the society's management are (i) administrative works including book keeping, (ii) accounting works, (iii) marketing and credit services, etc. For this training, a co-operative officer is appointed in each PM Office during the transitional period.

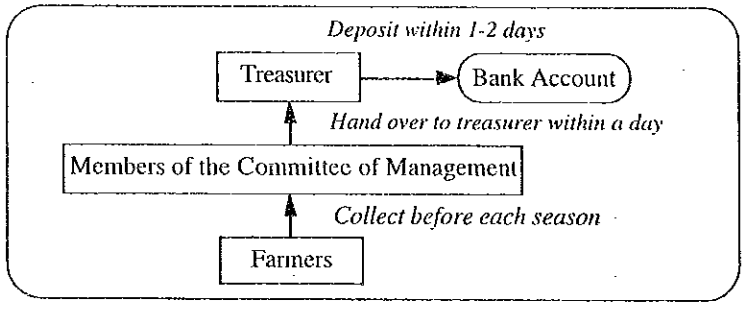
The training is divided into two (2) courses; intensive course and follow-up course. The former is implemented during the transitional period of O&M and includes all items mentioned above. The latter is conducted after the handing-over of O&M, and carried out for several specific items depending on their activities.

(6) Irrigation Service Fees

All O&M costs of irrigation facilities are covered by the irrigation service charges (ISC) collected from the farmers. The amount of ISC is estimated by each farmers' society, and includes basically the following items:

(a) Operation cost
(b) Maintenance cost
(c) Personnel cost for gate operators/pump attendants
(d) Replacement cost of facilities and equipment
(e) Collecting cost (transportation cost of collectors and treasurer)

The proposed collecting procedure of ISC is as follows: ISC is collected before each cropping season. All members of the committee collect ISC directly from the farmers, and the collected amount is deposited immediately in the society's bank account. The treasurer manages all these transactions.



To achieve smooth collection of ISC, it is recommended to adopt the following punishment rule and incentive to the farmers.

1) The society fines the farmers who fail to pay on time, some percentage of the total ISC amount per month during the non-payment period.
2) If farmers pay the ISC amount in full and on time, some percentage of the full ISC amount is reimbursed to them as an incentive.

The committee is responsible for management and operation of ISC. For the payment of O&M, there are two types. One is the recurrent costs such as electric charge and personnel costs, and the other is for the costs of emergency and specific O&M works. The former is paid by the treasurer after approval of the chairman and the general secretary, as a routine of the society's works. For the latter, a committee meeting is held to asses its necessity and release its fund for such emergency works.

(7) Articles and Bye-Laws

Standard articles and bye-laws on farmers' societies have been prepared by the Department of Co-operatives. But these are for the general co-operatives, and articles required for the new societies which will be responsible for the O&M of the project are not available at all. Although these standard articles and bye-laws are applied basically to the new societies, it is necessary to enact several new articles. These are listed below.

1) The society has the right to collect ISC from the beneficiary who receives irrigation services from the society, and the beneficiary has the duty to pay ISC to the society.
2) The society inflicts a punishment on the beneficiary who uses irrigation water and facilities illegally or who fails to pay ISC.
3) The beneficiary has the duty to participate in the communal O&M works which are planned by the society.
4) The tenant beneficiary has the right to join the society, and is bound to pay ISC and membership fees as proxy for the owner beneficiary .

In addition to these articles, it also be necessary to enact some laws at the national level on those legal basis.

(8) Irrigation Meeting

The crop production activities are linked with various agricultural support activities including machinery services, supply of farm inputs, credit services, etc., which are implemented by the public and private sectors, and all these should be co-ordinated closely with the farming. In this context, it is proposed to hold irrigation meetings under the presidency of the farmers' society. A meeting is held before each cropping season with the attendance of the following people:

(a) All farmers
(b) Members of the society's committee
(c) PM, GIDA
(d) District extension offices, MOFA
(e) District office of the Department of Co-operatives
(f) Banks and private sectors such as owners of farm machinery and dealers of farm inputs.

The agricultural co-ordinating committee assists the society in holding such meetings. In the meeting, the following items are discussed by the attendants. Based on the result of these discussions, the society requests the related agencies for necessary support services.

(a) Crops recommended to be cultivated in the season
(b) Cropping schedule including land preparation, seeding, transplanting, harvesting, etc.

(c) Irrigation schedule
(d) Required quantity of farm inputs such fertilisers and agricultural credits, and their supplying periods, etc.

All farmers confirm the irrigation schedule through the meeting, and the society commences O&M based on the result of the meeting.

3.4 Agricultural Support Services

3.4.1 Extension Services

For the extension activities, there are two agencies at present; MOFA for staple foods and GIDA for irrigated farming. As the basic approach to the study of agricultural extension, the strengthening of GIDA's activities is considered in this Project. The proposed extension system is described below:

The proposed organisational structure and the number of Subject Matter Officers (SMO) required for the Project are summarised in the following table, and the details are shown in Figure G-5. Qualified staff should be appointed for this new system.

Staffing of Extension System

Position	Subject Matters	Head Office	PM Offices*2	Total
SMO*1	Crops	1	-	1
SMO	Co-operatives, marketing and credits	1	-	1
SMO	Women's activities	1	-	1
SMO	Training	1	-	1
Extension Officers		-	5	5

*1 Subject Matter Officer
*2 PM Offices in the five priority projects. O&M officers and monitors are not included.

The agricultural extension services to be provided in the project areas are undertaken by the Project Management Division under the Department of Project Operations, GIDA. At present, two agronomists are attached to this division to deal with all subjects including paddy, vegetables, and plant protection. It is suggested to appoint more two officers. Their main subject matters are as follows, and they take charge of a portion of these matters:

1) Crops

(a) Identifying problems specific to the crop cultivation and help to solve these problems.
(b) Prepare proposed cropping calendars, plant protection practices and fertilisation plans.
(c) Distribution of improved varieties in co-operation with IDC.
(d) Dissemination of specific farming practices including the use of animal power, organic fertilisers, mulching cultivation of vegetables, etc.
(e) Promotion of post-harvest improvements such as storing and processing.
(f) Dissemination of the Pest Management Project, etc.

2) Co-operatives, Marketing and Credit

(a) Identifying problems specific to the co-operatives, marketing and credit, and help to solve these problems.
(b) Promotion of group loans, co-operative purchasing and shipping.
(c) Support of the society's accounting and auditing.
(d) Providing marketing and price information, etc.

3) Promotion of Women's Activities

(a) Identifying problems specific to the women farmers and households and help them to solve these problems.
(b) Identifying and implementing income generating activities based on agriculture.
(c) Implementation of home garden development programmes.
(d) Transfer of post-harvest technology to women farmers, etc.

4) Training

(a) Identifying areas or subjects relevant to many farmers and prepare mass media training programmes for the farmers.
(b) Preparation and implementation of training programmes for extension officers of the PM Offices.
(c) Assistance in issuing monthly or bi-weekly news bulletins.
(d) Preparation of training aids, etc.

Forced training programmes should be implemented for the GIDA's officers as well as the farmers, in order to enable them to carry out their duties effectively. It is well understood that field extension officers should be competent to understand farming as a whole, possess diagnostic skills, and able to identify appropriate actions. The extension officers in the project areas have however not so much experience in irrigation farming. The necessary training programmes for the officers are listed below. These programmes are managed by the Extension Division in co-operation with IDC in Ashaiman.

1) Training programme on development process: All agricultural officers in the head office and the PM Offices should be trained on problems identification and needs assessment to programme the design and its implementation. Before the implementation of the new extension system, it is necessary to educate all levels of the extension staff and get their views.

2) Training programme for communication: It has been observed that most of the extension officers in the project areas are very poor on communication skills. A good communication skill training programme should therefore be conducted with the implementation of the new extension system.

3) Pre-seasonal training: The pre-seasonal training programmes will be conducted by SMOs of the Project Management Division and officers of IDC. The training priorities will be strictly on the extension programme of the coming season. The extension officers in all PM Offices will participate in these programmes.

4) Specific Matter Training: This training will be conducted occasionally by SMOs of the head office and researchers in IDC. For the specific items such as irrigation method and planting practices, the extension officers are trained and become skilful through this training.

5) Specialised Training Programs: SMOs in the head office require more in-depth training in their subjects. They should participate in all the relevant specialised courses conducted by other agencies such as MOFA and CRI.

As for the extension system, the "T&V" system adopted by MOFA is proposed to be introduced in the project areas. Under the farmers' society, the farmers form irrigation groups consisting of 6-24 persons per one group (see Section 3.3 (2) and (3)). The extension services are made through these groups, and the Agricultural Sections of the farmers' societies assist to communicate between the extension officers and the irrigation groups. In order to carry out

extension activities more efficiently, the following points are recommended:

1) It would be recommended to organise at least two or three demonstration farms in each project. The extension officer in the PM Office appoints several excellent farmers for demonstration activities, who cultivate crops with advanced and proper practices, and demonstrate them to neighbouring farmers in the project area. The extension officer always keeps contact with them and provides technical and managing guidance with some farm inputs (recommended varieties, etc.).

2) In order to ensure effective extension works and induce good and easy understanding of farmers of the recommended practices, it is proposed to issue a farming calendar in a visual form as well as the leaflet issued by MOFA at present. A sample of proposed farming calendar is presented in Figure G-7. The main proposed practices during the period from sowing to harvesting are mentioned in one paper with the calendar, and important practices are mentioned visually by figures and tables. In order to simplify the practices to be adopted by the farmers, the units of quantity are indicated in bag and bottle, and figures of required quantity are mentioned in 0.2 to 0.5 ha indent. The farmers will paste this paper on wall and see it every day with the calendar. They cultivate crops according to the proposed practices mentioned visually on the paper. If farmers have questions on farming practices, the extension officer explains to them according to this calendar.

3) It is recommended to issue a local bi-weekly or monthly newspaper or bulletin on agricultural extension to the farmers. The main contents of these papers consist of articles on marketing and credit information, recommended practices and introduction of new varieties, water management news, homestead development news, co-operatives' activities, official notices from the government agencies, and so on. All texts are written in easy wording with simple sentences, because the papers are mainly for farmers.

At present, all PM Offices have almost no extension equipment and facilities. The following equipment is therefore proposed to be provided in each PM Office, in order to ensure effective extension activities. In addition, a bus for transportation of trainees (farmers) will also be equipped in IDC.

(a) Typewriter
(b) Printing machine (rotary mimeograph)
(c) Photocopy machine
(d) A pick-up for transportation of seeds and farm inputs to be provided to the demonstration farms, and to ensure adequate mobility and effectiveness of the services.

The printing and photocopy machines are for the preparation of leaflets, farming calendar and newspaper. The extension officer prepares such handmade and original papers which are closely related to the local farming and living conditions in co-operation with all staff of the PM Office and the farmers' society. The related agencies such as the extension offices of MOFA and the district office of the Department of Co-operatives will also be involved in these works.

3.4.2 Research Activities on Irrigation Farming

In order to achieve the final target of the Project and allow further development of agricultural production in the project areas, it is proposed to strengthen agricultural research activities for irrigated farming. Main activities necessary for the Project are listed below. It is expected that these activities are undertaken by IDC in Ashaiman.

1) Crop adaptability and variety tests
2) Research data on water management (deep percolation rate, holding capacity, effective root depth, etc.)
3) Water management and irrigation methods (proper irrigation interval, supply amount of water, etc.)
4) Fertilisation practices by each crop (proper application quantity, split dressing, etc.)
5) Pest and disease control
6) Specific cultivation techniques such as mulching practices for vegetable cultivation and preparation of organic fertilisers
7) Seed production, etc.

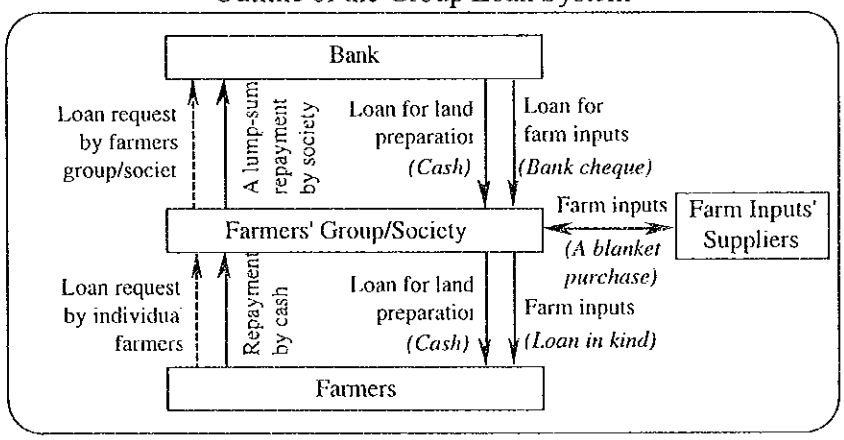
3.4.3 Improvement of Agricultural Credits

At the initial stage of the Project, the farmers need a considerable amount of loan for purchasing farm inputs for crop cultivation, especially for vegetables. At present, several credits have been let by the banks in and around the project areas. These credits have however serious problems as discussed in Sub-section 1.2.3. To overcome these problems, it is proposed to introduce group loan or revolving loan systems. These are a comprehensive system including agricultural credit, marketing and technical guidance, and managed by the societies. The difference between them is financial sources, the former loan system obtains it from banks and the latter is from public agencies. The details are described below:

1) Group Loan System

The group loan system is outlined below:

Outline of the Group Loan System

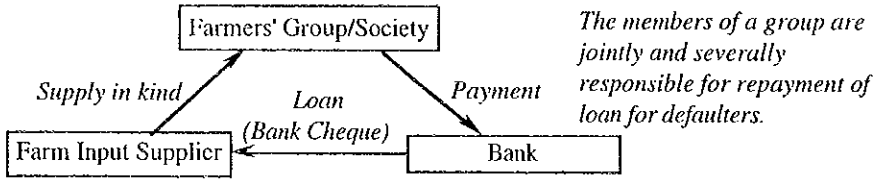


This loan system is managed by a farmers' group or the society, and loan procedures are as follows:

a) The loan is limited only to the purchase of farm inputs, and its ceiling amount is set depending on crops.
b) For borrowing loan, the farmers form a group and select a representative. The members of a group are jointly and severally responsible for repayment of loan for defaulters.
c) Farm input requirement is estimated by the group together with the required loan amount. At this time, the extension officer of the PM Office gives technical guidance such as recommended fertilisation and agro-chemicals to be used.
d) The bank provides a loan for the group on a lump sum basis or dividing into

two portions. The group purchases farm inputs in one lot.

e) The bank provides the loan amount only to the supplier of farm inputs, and the group receives farm inputs in kind from the supplier. In other words, the group and its representative do not touch cash money, except for the bank cheque to be issued to the supplier. A schematic flow of the procedure is as follows:



f) The representative collects the loan payment amount from each farmer, and repay it to the bank in a lump sum. The bank does not collect the loan payment amount from individual farmers.

A characteristic of the group loan system is closely connected with the farm guidance, improvement of farm input supply and strengthening of farmer organisations, as shown in a schematic figure presented in Sub-section 3.4.4, and this system has following merits:

a) The lending operation is very simple and easy as compared to individual loan.
b) The loan payment collection is also very easy, because collection from individual farmers is carried out by the representative, and the bank stays only in contact with him for the loan payment collection.
c) The introduction of joint and several liability by the farmers living in a same place brings about a good result to improvement of loan repayment.
d) The farm input suppliers can allow a large discount for a blanket purchase, and the group under the loan system can purchase farm inputs on these discount prices.

The possibility for the introduction of the proposed loan system was confirmed with the farmers in the irrigation projects and the head office of the Agricultural Development Bank (ADB), Accra. At the public meeting, the leaders of the societies and farmers said that the introduction of group loan system is possible and the societies could manage this system if GIDA or other related agencies support to the societies. At present, the societies in Tanoso and Akumadan have borrowed some loans from the banks under joint and several liability of the members, which is similar to the proposed loan system. It seems that all societies can manage such a new credit system without problems. On the other hand, ADB said that it is possible to provide loans to the farmers' groups or the societies under such system and conditions. ADB has similar loan system which is provided to the farmers' groups, and the loans will be lent to the societies through the following branch offices.

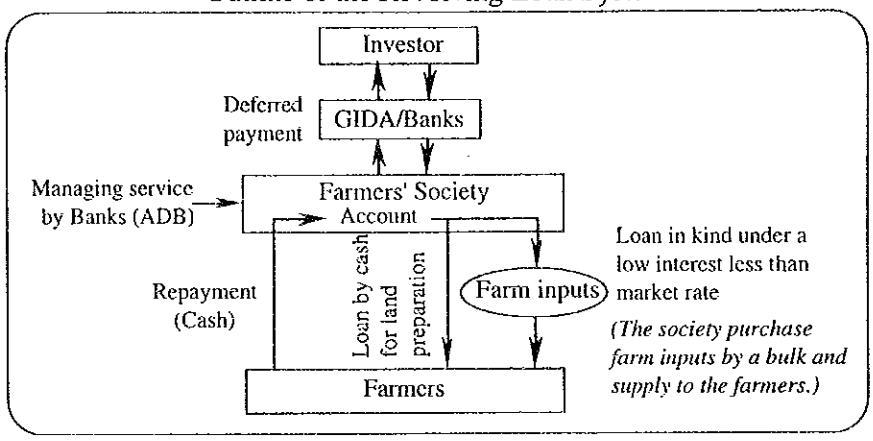
Projects	ADB Branch Offices
1) Ashaiman	Tema
2) Aveyime	Tema
3) Kpando-Torkor	Hohoe
4) Mankessim	Cape Coast
5) Okyereko	Cape Coast

Source: ADB Accra

2) Revolving Loan System

The revolving loan system is managed by the farmers' society. Outline of this system is as follows:

Outline of the Revolving Loan System



The implementing agency of the project (GIDA) arranges a considerable amount of funds, and provides it to the society under the condition of prevailing interest. The society lends its money to the farmers at an interest rate lower than the market rate. The repayment amounts from the farmers are deposited in the society's account, and the society finances the farmers again. Surplus from the revolving loan goes to payment to the investor. It is necessary that the bank provides supporting services to the society for management of the revolving loan system, because the society, which is the managing agency of the revolving loan system, has no knowledge and experience on such banking business. ADB is now providing management service for loans to irrigation projects. The Dawhenya irrigation project has a revolving loan system, and ADB has undertaken its management. ADB said that it is also possible to provide management service to other irrigation projects, if they so require.

This loan system is managed comprehensively with the agricultural extension services and proposed marketing system as well as the group loan system, as mentioned earlier. The merit of the revolving loan system is a lower interest rate than the market rate. But, this loan system requires a considerable amount of funds to be acquired at a low interest rate. If no funds are available, it is proposed to introduce the group loan system.

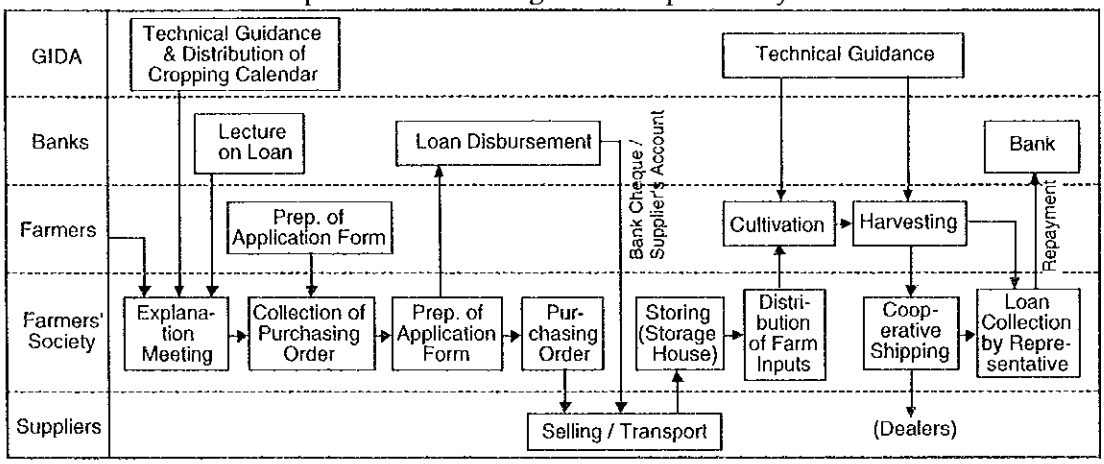
3.4.4 Improvement of Marketing

Farm input supply on time is one of the important factors for improving crop yields. To ensure smooth supply of farm inputs, a co-operative purchasing system is recommended to be introduced in the project areas. This system is closely connected with loan services, technical guidance and society's activities as mentioned earlier, and has the following merits:

1) Through this system, the farmers can arrange all necessary farm inputs before the crop season, and they can use those inputs on time according to the necessity;
2) Under a blanket purchase system, the farmers can purchase farm inputs at discount prices;
3) Transportation services will be available from suppliers and/or the PM Offices; and
4) By directly purchasing from suppliers, the farmers can obtain necessary and enough quantity of farm inputs.

The overall flow of co-operative purchasing system to be introduced to the societies is presented in the chart below along with the group loan system. For successful management of this co-operative purchasing system, the following matters are essential; financial and technical supports from other agencies such as the banks and the PM Office of GIDA and a close co-ordination between them.

Co-operative Purchasing and Group Loan Systems



Thus the farm inputs such as fertilisers and agro-chemicals would be supplied smoothly by the private suppliers through this system. As for the seed supply, the seeds of cereal crops have been supplied by MOFA and seeds of vegetables are by the private sector at present. The result of interview survey carried out by the Survey Team shows that most of the farmers in the project areas have no problems in purchasing these seeds. The seed supply is therefore entrusted to them so far. However, the supply of qualified seeds will be necessary to increase crop yields in near future. It is expected that IDC or other accepted suppliers produce such certified seeds and provide to the farmers through the GIDA's extension system.

At present, the dealers (market mummy) are handling a lot of farm products in the project areas. Their marketing activities cover all the country and are carried out from village to village and in urban areas. With the exception of the Mankessim project, no information on marketing problems is available from the project areas. In the case of Mankessim, the project area is under the buyer's market, and the farm gate prices of products have been wrongfully controlled by the dealers who come from the Mankessim market. To overcome such a problem, it is proposed to introduce a co-operative shipping system managed by the society. Such co-operative shipping may be possible to introduce to the Mankessim project. At present, some farmers in the Mankessim project area have sold their products directly to another market near Accra.

3.5 Role of Women in Development

The Project will induce activation and strengthening of the crop production, marketing of farm inputs and products, post harvest, transportation, societies' services, etc. In parallel with such economic and social development in the rural areas, the women farmers will have much opportunity to join these activities. The following measures are proposed for the women in development.

1) In order to encourage greater participation of women in public affairs, it is recommended to appoint women's leaders in the farmers' societies. The appointment of women as auditors of the societies is ideal.

2) Groundnuts, tomatoes and soybeans are recommended in the cropping pattern. To solve the problem of women unemployment in the project areas and improve their income source, it is proposed to promote value-added processing of these crops by women's groups. The PM Office provides technical guidance for them, and the society makes necessary arrangements for bank loans to purchase the extracting and processing equipment.

3) In addition, homestead development and a wide scale livestock raising of chicken,

rabbit, etc. by the women's groups are also proposed for the women in development.

The farmers' societies should play an important role in promoting these activities, and GIDA should provide necessary guidance to them. In this context, the establishment of women's groups in the societies is proposed as mentioned in Section 3.3 (2). A representative of a women's group joins the committee of management as its member, and participates in all the society's management. To promote these activities mentioned above, it is also proposed to appoint a subject matter specialist by the Project Management Division in the head office of GIDA (see Sub-section 3.4.1). At the field level, intensive promoting activities are undertaken by the co-operative officer stationed in the PM Office during the transitional period of handing-over, and after the handing-over of O&M, the extension officer conducts some follow-up services.

3.6 Staff and Facilities Required for O&M

The staff and facilities required for the implementation of O&M are summarised below and the details are presented in Table G-6. The staff were minimised as much as possible, taking into account the restructuring of GIDA and saving of O&M cost.

Staff and Facilities Required for O&M Stage

Projects:		Ashaiman	Aveyime	Kpando	Mankessim	Okyereko	Total
Development Area*1	(ha)	54 *1	95	155	86	81	471
Staffing of PM Office	(Persons)						
(1) Transitional period of O&M		6	5	9	5	5	30
(2) After handing over of O&M		5	4	8	4	4	25
Office and Buildings							
a) PM Offices							
- Rehabilitation	(m2)	106	-	-	-	-	106
- Construction	(m2)	-	175	175	175	175	700
b) Store houses*2	(No.)	1	1	4	3	-	9
Training Facilities							
Lecture hall	(m2)	32	-	-	-	32	64
Dormitory for farmers	(m2)	263	-	-	-	-	263
Dormitory for officers	(m2)	80	-	-	-	-	80
Vehicles and Equipment							
(1) O&M equipment	(Set)	1	1	1	1	1	5
(2) Equipment for extension	(Set)	1	1	1	1	1	5
(3) Office equipment	(Set)	1	1	1	1	1	5

*1 Excluding 2 ha of experimental farm (IDC). *2 For agriculture.

In parallel with the rehabilitation works, the existing PM Offices in the project areas should be reorganised and strengthened as the executing agencies for the handing-over of O&M. The total number of staffs to be stationed in the PM Offices is estimated to be 30 during the transitional period and 25 after the handing-over of O&M to the farmers.

The existing buildings in the Ashaiman will be rehabilitated completely and used continuously as the PM Office. For the four (4) projects of Aveyime, Kpando-Torkor, Mankessim and Okyereko, a new building will be constructed for each project. This building will have a floor space of 175 m^2 including an engineering room (25 m^2), an extension room (25 m^2), a monitoring room (25 m^2), a co-operative room (25 m^2), a meeting room (50 m^2) and others (25 m^2). In addition, buildings for training will be constructed in the Ashaiman and Okyereko projects. Each PM Office will have necessary O&M and extension equipment in sufficient quantity for providing support services to the societies.

4. STUDY FOR PROJECT SUSTAINABILITY

4.1 Government's Effort

In order to overcome the present constraints and problems and to achieve the sustainable O&M of the project, the executing agency should undertake the following activities:

Activities up to the end of the rehabilitation works

1) Training of staffs involved in all of the project implementation including supervision of rehabilitation works, handing-over of O&M, support services for O&M, extension of irrigation farming, strengthening of the farmers' societies, improvement of marketing and credit, etc.
2) Training of the farmers and leaders of the societies in the project area
3) Strengthening of the executing agency for organisational structure and staffing
4) Strengthening of the farmers' societies
5) Strengthening of the extension activities for irrigation farming

Activities after the rehabilitation works

1) Continuous support services for O&M, irrigation farming and activities of the farmers' societies
2) Periodical monitoring and evaluation for the farmers' O&M works
3) Follow-up training to the farmers and staffs concerned
4) Financial support to the farmers for replacement of equipment

These are all prerequisite factors not only for achievement of the sustainable Project but also for implementation of the Project itself. For the activities from item 1 to 5, the executing agency should take up them just after the commencement of the rehabilitation works. In addition, it is recommended to prepare manuals for O&M of irrigation facilities as well as for irrigation farming practices for each crop proposed in this plan by the end of the rehabilitation works. The farmers require these manuals for their O&M and irrigation farming from the initial stage after the rehabilitation.

After the rehabilitation works, the continuous support services and the follow-up training are also essential factors as well as the activities mentioned above, and the executing agency should undertake these activities or co-ordinate them among the agencies concerned.

For the projects having pumping irrigation facilities, a considerable amount of replacement cost for those equipment will be required at about 15 years after the construction, and its amount will over the payment capacity of the farmers, even if they will have a good income from the irrigation farming. It will be necessary that the government give some subsidies to the farmers. GIDA stated that the government will make up the balance of the replacement cost.

4.2 Effort by Beneficiary

The farmers' self-reliance for project implementation will be one of the essential factors to achieve the project sustainability. Through the public meetings held at each project site, they showed some self-reliance, particularly for the farmers' participation in the rehabilitation works, land acquisition in the project areas and final levelling in the extension area.

1) All farmers accepted the participation in rehabilitation works with its full understanding. They stated that all farmers can join those rehabilitation works free of

charge, and it is of importance not only for the training purpose but also for the sustainable O&M.

2) Generally, the government has a responsibility for the land acquisition in the development areas. But these land acquisitions are always delay due to no land compensation to the land owners (villages). All farmers well know this actual situation, and after the meeting, the leaders of the farmers societies in the project areas unofficially commenced the arrangement of the land acquisition in the development areas by themselves.

3) To the extension areas to be constructed new irrigation system, the project provide only rough levelling and those final levelling are entrusted to the beneficiaries. At the public meeting, the farmers accepted to carry out the final levelling works by themselves.

In addition, they have a positive attitude toward the project implementation. For O&M by the farmers themselves, all farmers have agreed on it. Then they accepted the increase by 50-150% of irrigation services fees after the rehabilitation. It may be said that such farmers' attitude will bring a good result to achieve the sustainable O&M of the project.

Apart from the above self-reliance, all existing farmers' societies should be reorganised and strengthened before the handing-over of O&M. All farmers have agreed on its strengthening plan formulated in the Interim Report, and have desired to implement such plan as soon as possible. To this strengthening of the existing societies, it is necessary to provide powerful support services such as training programme and institutional guidance. The executing agency should undertake these support services, and should co-ordinate all related agencies including DAES and the Department of Co-operatives.

TABLES

Table G-1 Present Condition of the Farmers' Societies in the Projects (As of December 1995)

Projects	Name of Farmers' Societies	No. of Member *1	Exe-cutive Staff*1	Year Estab-lished	Year Regis-tered	Bye-Laws *2	Entrance Fee (CD)	Share Capital (CD each)	Other Fee (CD/year)	Meeting of Exe. Committee per Year	Loan (1994-95) (CD)	Facilities and Equipment	Tribe of Members
(1) Ashaiman	Ashaiman Co-operative Irrigation Rice Farmers Society Ltd.	120	9	1983	1983	A	100	6,000	2,000	4 times	-	None	Ga, Ewe, etc.
(2) Aveyime	Aveyime Irrigation Farmers Association	60	7	1981	1990	B	1,000	-	2,400	12 times	-	None	Ewe
(3) Kpando-Torkor	Kpand-Torkor Co-operative Farmers' Society	118	7	1974	-	None	2,000		-	12 times	-	None	Ewe
(4) Mankessim	Beefikrom Co-operative Irrigation Vegetable Growers and Marketing Society	89	7	1987	-	None	2,000	6,000	-	Every month during a season	-	None	Fanti
(5) Okyereko	Okyereko Irrigation Rice Farmers Co-operative	68	6	1994	-	None	None	5,000*3	-	24 times	-	None	Fanti

Remarks: *1 As of 1995 *3 Contribution

*2 A: Bye-Laws prepared on the basis of the form of the Department of Cooperative.
B: Bye-Laws not coincide with the form of the Department of Cooperative.

Source: Interviewed by the Study Team

Table G-2 Present Transfer Process of Project Management to Farmers' Organisations - GIDA

Developmental Stage	Formation and/or Strengthening of Existing Co-operatives	Discussing, Enumerating, Sharing of Responsibilities and Training of Farmers in New Areas	Monitoring, Evaluation and Training of Farmers in Desired Areas	Handing Over Process
Activity Areas	- Explain new concepts of project management to farmers dwelling on main policies of GIDA in project management. - Help organize farmers to select leaders - Help to register society - Help to set up Committees as enshrined in the LI 1350	- Discuss the present IDA management function isolating the various functions as contained in the Book "Proposal for Strengthening Management of Regional and Project Officers and Rationalization of Water Charges." - Identify the weaknesses and strengths of the farmers groups. - Discuss the functions and responsibilities based on identified weaknesses and strengths of both the GIDA and the farmers' groups. - Train the farmers in areas where they lack skills. - Recommend training needs to GIDA when not available at project site. - Share office and other facilities with the co-operative. - Sign all project cheques with President/ Chairman of farmers co-operative. - Fix cropping pattern and calendars with farmers. - Prepare and discuss operational budget with farmers and show them the implications of decisions taken. - Fix meeting days for management meetings with co-operatives and make sure they participate.	- Continuously evaluate performance and institute or recommend training for farmers. - Handing over more responsibilities to farmers where they have shown capabilities of handling the affairs of the particular area.	- Handing over all areas which farmers are capable of organizing supervising and managing. - Further train farmers or recommend training in areas where they are not yet capable of operating. - Advice GIDA on areas to be reserved for its own management and give reasons. - Suggest possible areas of back stopping Missions if necessary
Period of Activity	Six months	One year	One year	Six months

Source: GIDA

Table G-3 Status of Land Tenure in the Project Areas and Land Allocation at Present

Project Areas		Area (ha)	Status	Allocation	Remarks
(1) Ashaiman	Existing area	57	GIDA	Allocated	The farmers said that the land belong GIDA.
(2) Aveyime	Existing area	63	GIDA	Non	The farmers and PM said that the land belong GIDA.
	New Area -1	17	Private	-	A family hold all land of new area - 1. The existing society requested to this family for the use of their land, and the head of family agreed on it, under the condition that a high priority for land allocation is given to his family.
	New Area -2	15	GIDA	Non	At present, several farmers are cultivating crops at this land, but they do not know the land tenurial status of this land. The leaders of existing society and PM said that the land belong GIDA.
(3) Kpando	Existing area	40	Community	Non	All lands in the project area belong to Dzigbe village and have been managed by the village chief. The leaders of the society and the village chief had meeting on land acquisition. Then they had an understanding that Dzigbe village provides the lands necessary for the development project.
	New Area	146	Community	-	
(4) Mankessim	Existing area	29	GIDA	Allocated	The farmers said that the land of existing area belong to GIDA.
	New Area	57	Community	-	The lands of the new area belong to Beefikrom village. The village chief of Mankessim has a power to use the lands of Beefikrom village, and he agreed on the irrigation development in these lands by GIDA.
(5) Okyereko	Existing area	39	Community	Allocated	All lands to be developed by the project belong to Okyereko village. The village chief stated that these lands are released from the village under the condition that all lands are allocated only to the farmers in Okyereko village. In this case, it is not necessary to pay land compensation.
	New Area -1	24	Community	-	
	New Area -2	18	Community	-	

Source: Information obtained from farmers, PM and Regional Offices of GIDA.

Table G-4 Irrigation Service Fees of Each Irrigation Project

Projects	Irrigation	Developed area*1 (ha)	Main Crops*2 Grown in the Areas in 1994-95	No. of Farmers in 1996	Amount of Irrigation Service Fee in 1996 (CD/ha/season)	Payment Period	Collecting Situation in 1994*3 (%)
(1) Ashaiman	Gravity	130	Paddy, Okra	120	50,000	After harvesting	12.3
(2) Aveyime	Pump/Gravity	63	Paddy	62	155,000	-	-
(3) K.-Torkor	Sprinkler	40	Okra	118	250,000	Before cropping	100.0
(4) Mankessim	Sprinkler	17	Eggplant, Watermelon	89	100,000	Before cropping	100.0
(5) Okyereko	Gravity	40	Paddy	68	50,000	Before cropping	50.0 *4
Total		290		982			

*1 GIDA's data *2 Under irrigated condition *3 Ratio to total amount to be collected.
*4 Estimated by the Project Manager. No detailed figure is available.
Source: Data and information obtained from PM Offices and leaders of the existing societies.

Table G-5 Present Condition of GIDA's Agricultural Extension in Each Irrigation Project

Projects	Developed Area (ha)	Main Crops*1 Grown in the Areas in 1994-95	No. of Farmers *2	No. of Staff in PM Office*2	No. of Extension Staff *2	Facilities and Equipment for Extension	Vehicles*4	Remarks
(1) Ashaiman	130	Paddy, Okra	120	4	2	Video, V. Camera OHP, Slide Projector	Pick-up x 2	IDC-JICA
(2) Aveyime	63	Paddy*3	62	6	2	None	Pick-up x 1	
(3) Kpando-Torkor	40	Okra	118	3	1	None	-	
(4) Mankessim	17	Eggplant, Water melon, Okra	89	5	1	None	Truck x 1	
(5) Okyereko	40	Paddy	68	2	1	None	-	
Total	290		982	20	7			

*1 Under irrigated condition
*2 As of October 1995. Number of extension staff in the PM offices.
*3 1994-1995 Not cultivated
*4 Almost all extension officers of MOFA have a motorcycle, but in case of GIDA's extension staff, they have no motorcycle, except for these vehicles of O&M.

Source: PM Office in each project area.

Table G-6 Number of Staff after Handing-over of O&M

	Present Condition			Proposed Staffing after Handing-over			
	Department	No. of Staff		Department	No. of Staff		Remarks
GIDA Head Office	Department of Project Operations	- Director	1	Department of Project Operations	- Director	1	
	- Project Management Division	- Agronomist	2	- Extension Division	- SMO (Training)*1	1	
	- Project Accounting Division		0		- SMO (Crops)*1	1	
	- Plant & Equipment Division	- Deputy Director	1		- SMO (Co-op., Marketing & Credit)*1	1	
	- Agricultural Division	- Deputy Director	1		- SMO (Women's Activities)*1	1	
	- Soil Division	- Deputy Director	1	- O&M Division	- Irrigation Engineer	1	
					- Civil Engineer	1	
					- Mechanical Engineer	1	
					- Mechanic	1	
				- Project Monitoring and Evaluation Division	- Agro-economist	1	
					- Irrigation Engineer	1	
					- Book Keeper	1	
					- Computer Operators	2	
	Total		6	Total		14	

PM Offices	Irrigation	Develop-ment Area (ha)	No. of Staff		Irrigation	Develop-ment Area (ha)	No. of Staff		Remarks
Ashaiman	Gravity	130	- PM (Production Officer)	1	Gravity	56	- O&M Officer	1	- O&M is carried out by the society.
			- Technical Officer	1			- Extension Officer	1	
			- Water Bailiff	1			- Monitor	1	
			- Watchman	1			- Operator of Heavy Equipment	1	
							- Watchman	1	
Aveyime	Pump/ Gravity	63	- PM (Production Officer)	1	Pump/ Gravity	95	- O&M Officer	1	- All facilities are operated and maintained by the society.
			- Senior Production Officer	1			- Extension Officer	1	
			- Pump Attendant	1			- Monitor	1	
			- Watchmen	2			- Watchman	1	
			- Cleaner	1					
Kpando-Torkor	Sprinkler	40	- PM (Senior Technical Officer)	1	Sprinkler	155	- O&M Officer	1	- The PM Office operates two pump stations, and the farmers are responsible for O&M of sprinkler irrigation systems below pump stations. The PM Office employs two pump attendants, and the society employs several assistant pump attendants for assisting operation of pump stations by the PM Office.
			- Pump Attendant	1			- Extension Officer	1	
			- Watchman	1			- Monitor	1	
							- Pump Attendants	2	
							- Watchmen	3	
Mankessim	Sprinkler	17	- PM (Production Officer)	1	Sprinkler	86	- O&M Officer	1	- The society employs two pump attendants and several assistant pump attendants for operation of two pump stations. The PM office has no such operators.
			- Driver (Mechanic)	1			- Extension Officer	1	
			- Pump Attendant (Mechanic)	1			- Monitor	1	
			- Watchman	1			- Watchman	1	
			- Surveyor	1					
Okyereko	Pump/ Gravity	40	- PM (Production Officer)	1	Pump/ Gravity	81	- O&M Officer	1	- All facilities are operated by the society.
			- Labourer	1			- Extension Officer	1	
							- Monitor	1	
							- Watchman	1	
Total		290		20		473		25	

*1 SMO = Subject Matter Officer

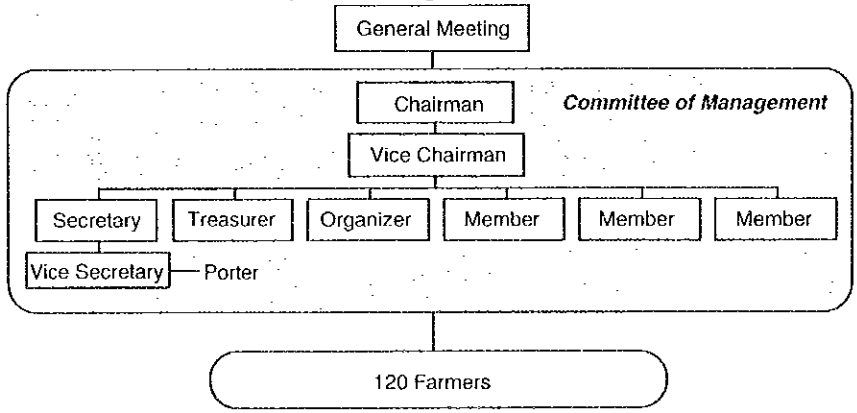
Table G-7 Training Courses and Contents for O&M and Strengthening of Farmers' Societies

Training Course	Period of Course (day)	Persons/ Course (Person)	Times/ Year (Time)	Trainees	Contents of Training
Course-A	2	4 - 5	1	Senior officers of GIDA and other agencies involved in O&M (Director, Deputy Director, department heads, etc.)	- Outline of O&M and strengthening of the societies, - Outline of agricultural support services, - Farmers' participant management system, - Role of women in development
Course-B	6	20	2	Officers involved in O&M (Regional managers, officers of head office, PM, production officers, technical officers, etc.)	- Estimation of water requirement - Preparation of irrigation schedule, - O&M of facilities and handing over process, - Strengthening of the farmers' societies, - Duties of GIDA and the farmers' societies for O&M - Monitoring system, measuring and surveying methods, - Administrative services to the farmers, - Promoting women in development, etc.
Course-C	12	20 - 30	3	Farmer's level including leaders of the farmers' societies, gate keepers, pump attendants, mechanics, key farmers and informal rural leaders.	- O&M of facilities, water requirement, water delivery, etc. - Irrigation schedule and cropping calendar, - Management of the farmers' societies such as accounting, book keeping and auditing, - Articles and by-laws for O&M - Duties of GIDA and the farmers' society for O&M - Monitoring system, measuring and surveying methods, - Group loan, cooperative purchasing of farm inputs, etc.
Course-D	2	20	2	Officials involved in irrigation management in other agencies (extension officers of MOFA, officers of the Department of Cooperative at district level, Banks, etc.)	- Objectives and outline of O&M by the farmers' society, - Activities of farmers' society, - Required agricultural supporting services, - Promoting women in development, etc.
Course-E	2	20 - 30	1	Village chiefs, elder people in the village, etc.	- Outline of O&M by the farmers' society, - Organization and activities of the society, - Duties of GIDA and the farmers' societies, etc.

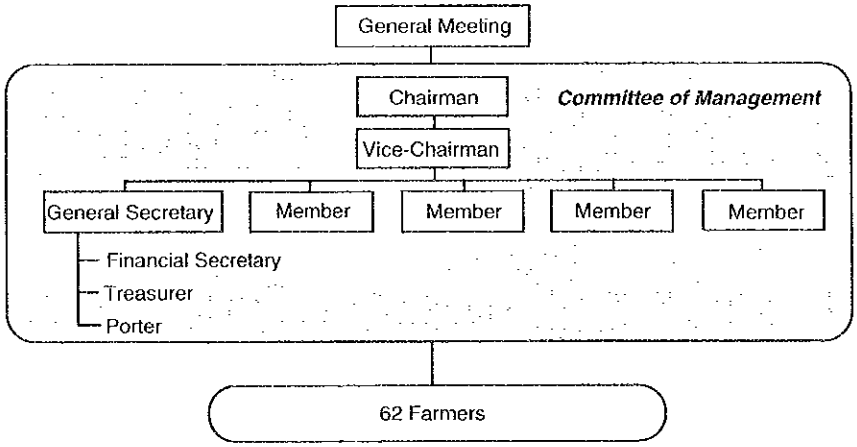
Note: The following-up training for specific items is conducted occasionally after handing over of O&M.

FIGURES

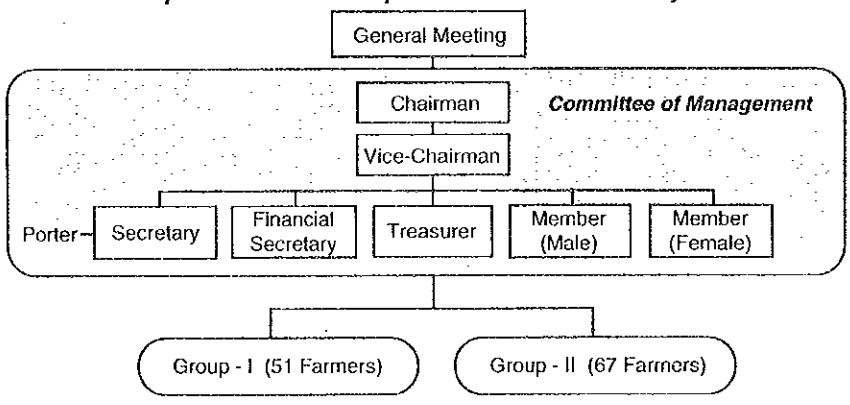
The Ashaiman Co-operative Irrigation Rice Farmers Society Ltd.



Aveyime Irrigation Farmers Association (AIRFAS)



Kpando-Torkor Co-operative Farmers Society Ltd.



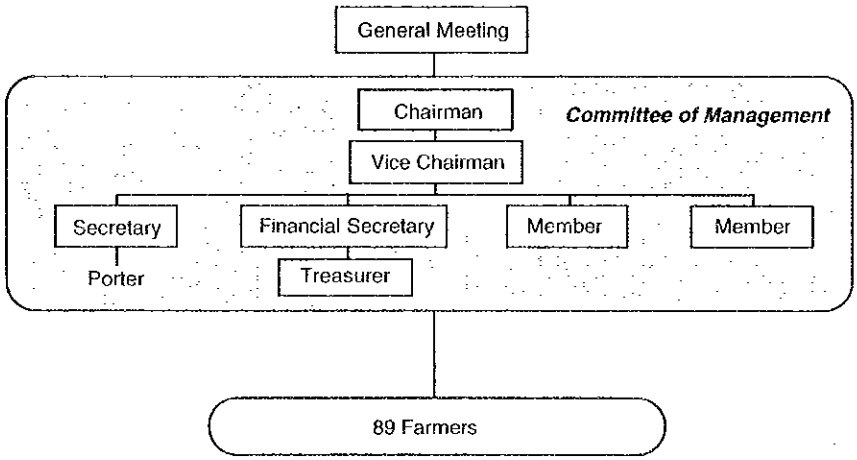
Note: As of December 1995

Figure G-1
Organisational Structure of Existing Farmer's Societies (1/2)

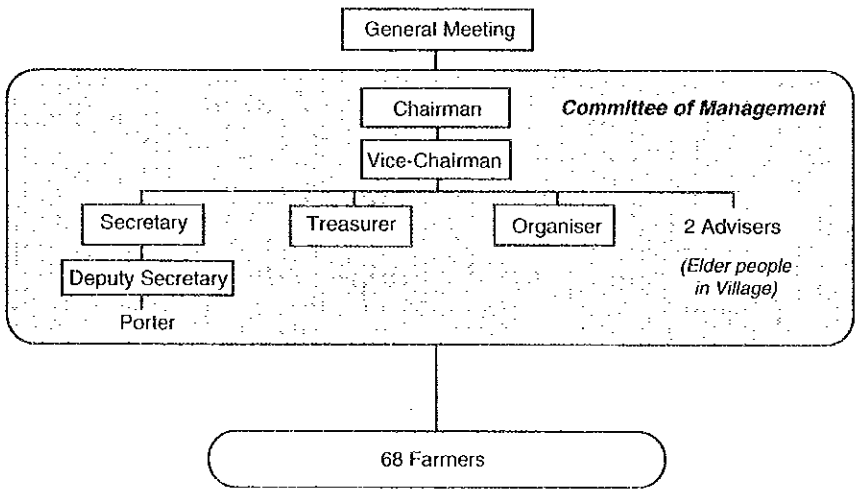
THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

Japan International Cooperation Agency

Beefikrom Co-operative Irrigation Vegetable Growers and Marketing Society Ltd. (Mankessim Irrigation Project)



Okyereko Irrigation Rice Farmers Co-operative



Note: As of December 1995

Figure G-1
Organisational Structure of Existing Farmer's Societies (2/2)

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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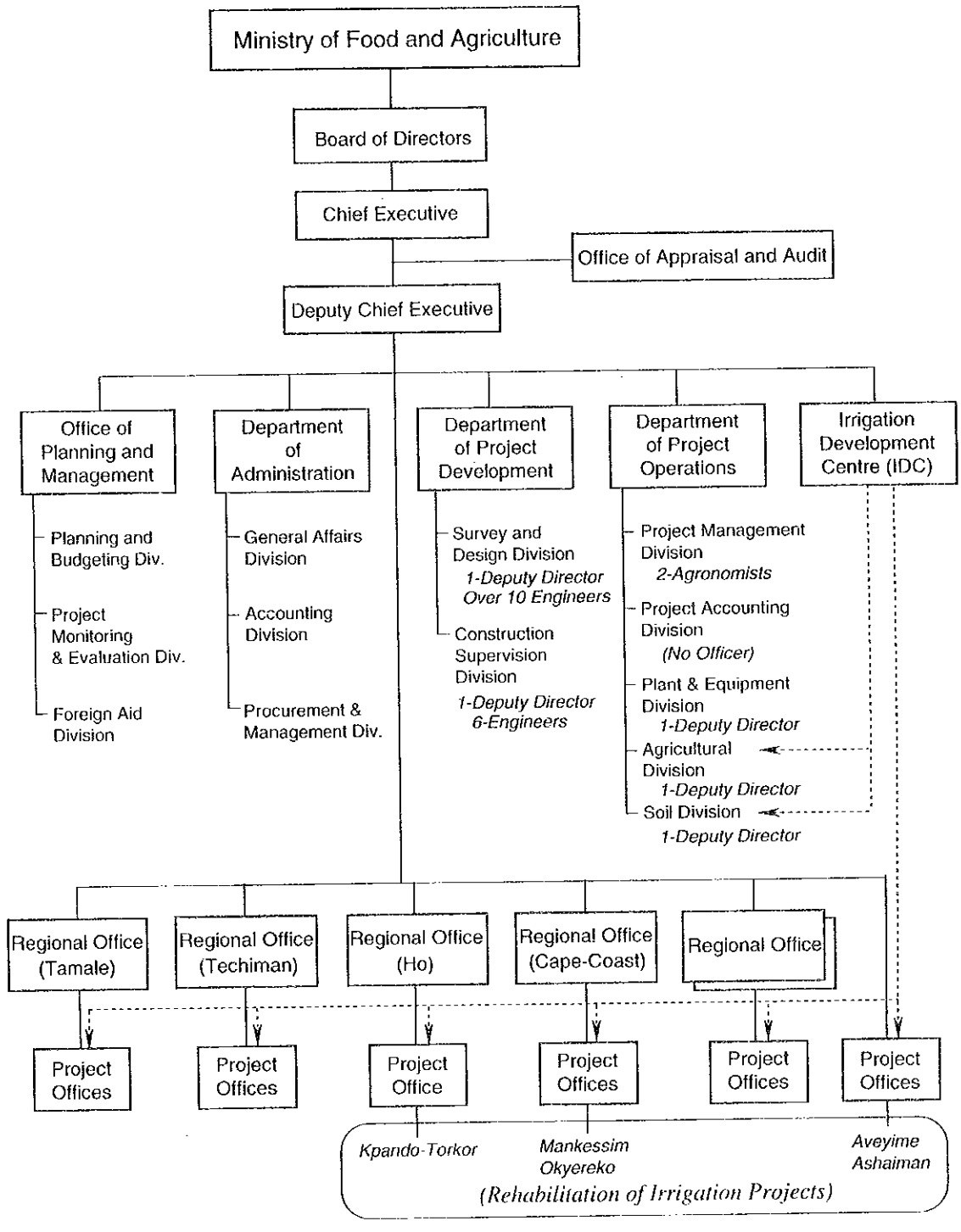

Note: As of December 1995 Source: GIDA Head Office

Figure G-2
Present Organisational Structure of Ghana Irrigation Development Authority (GIDA)

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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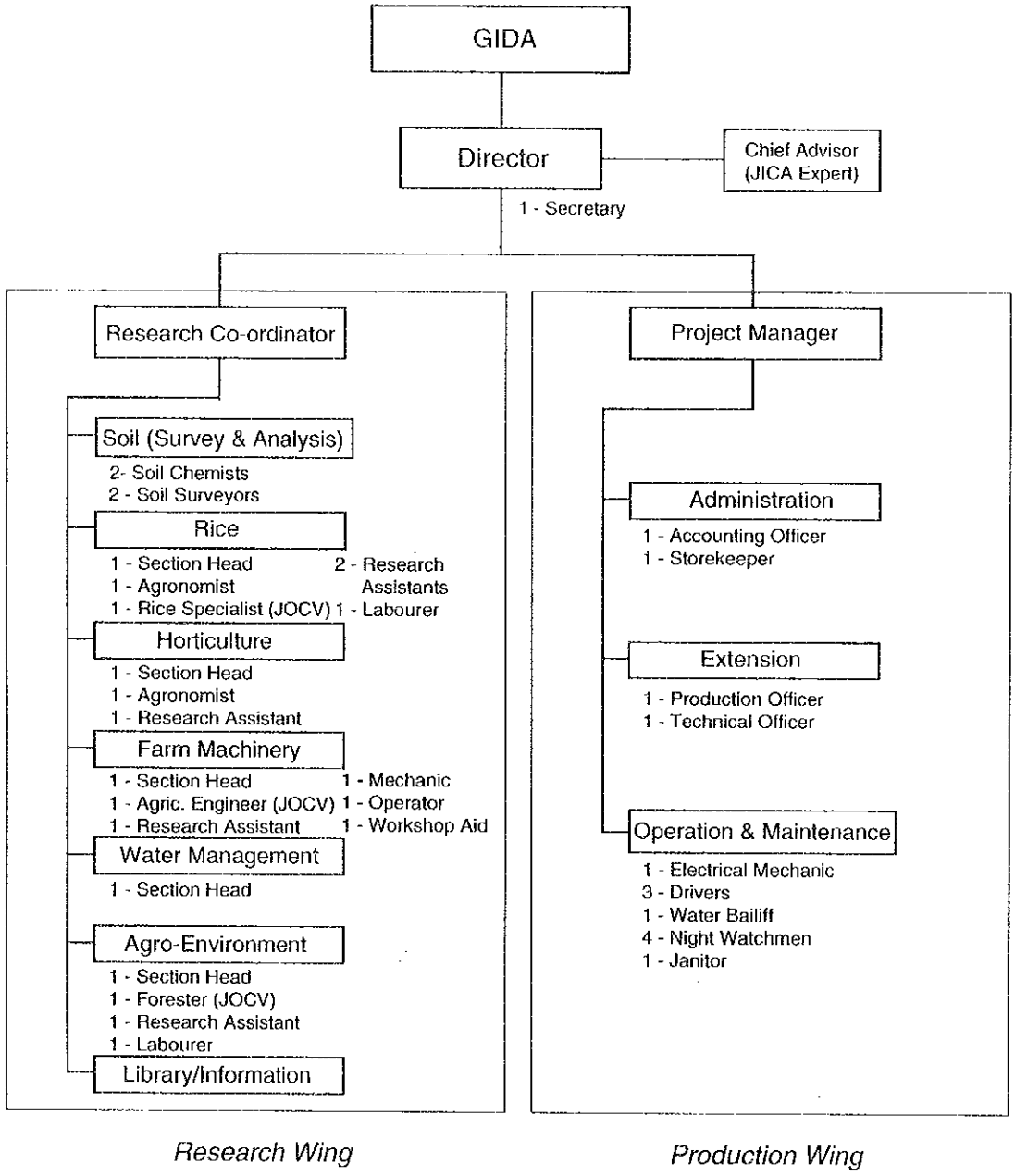

Note: As of November 1996 Source: IDC

Figure G-3
Present Organisational Structure and Staffing of Irrigation Development Centre (IDC)

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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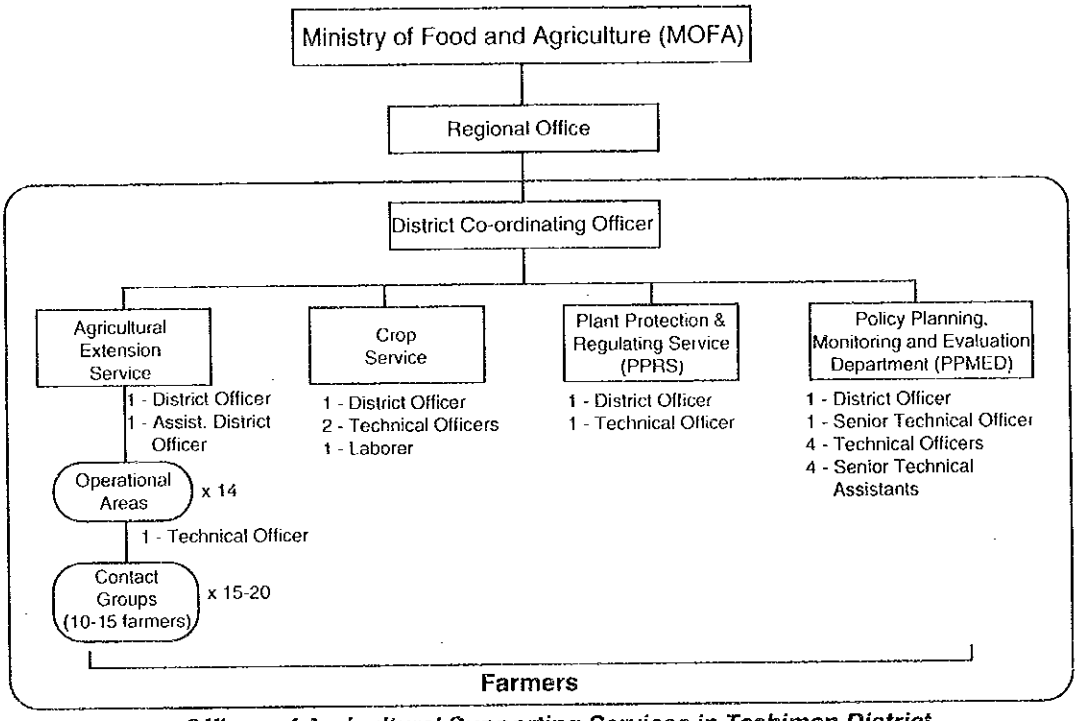
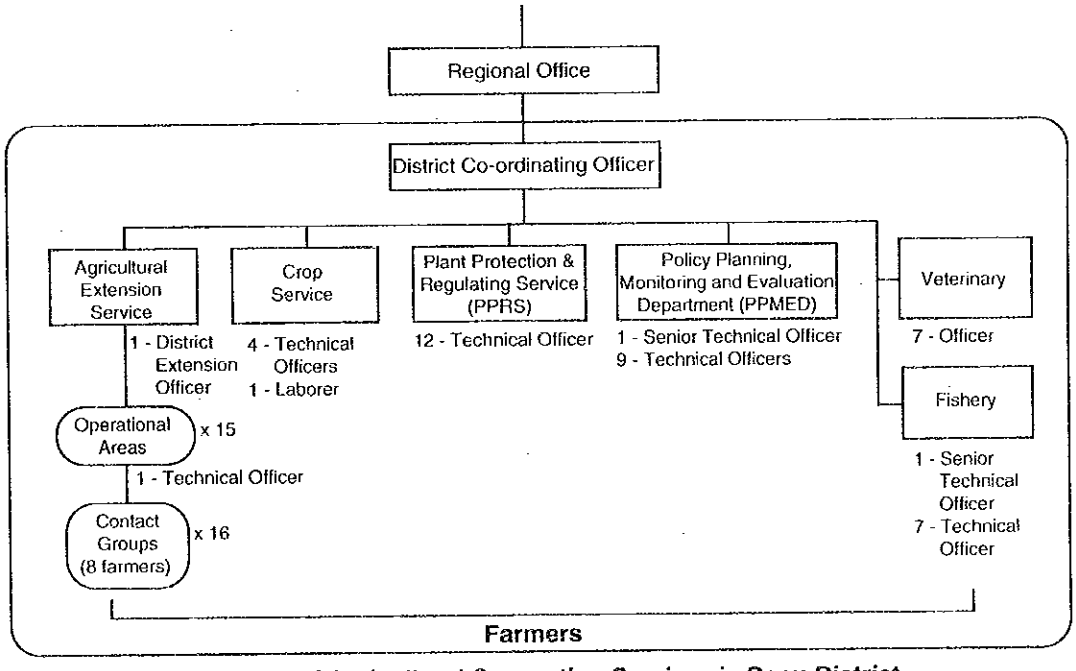


Offices of Agricultural Supporting Services in Techiman District



Offices of Agricultural Supporting Services in Denu District

Note: As of December 1995
Source: MOFA District Offices of Denu and Techiman

Figure G-4
Organisational Structure of Agricultural Support Services by Ministry of Food and Agriculture (MOFA)

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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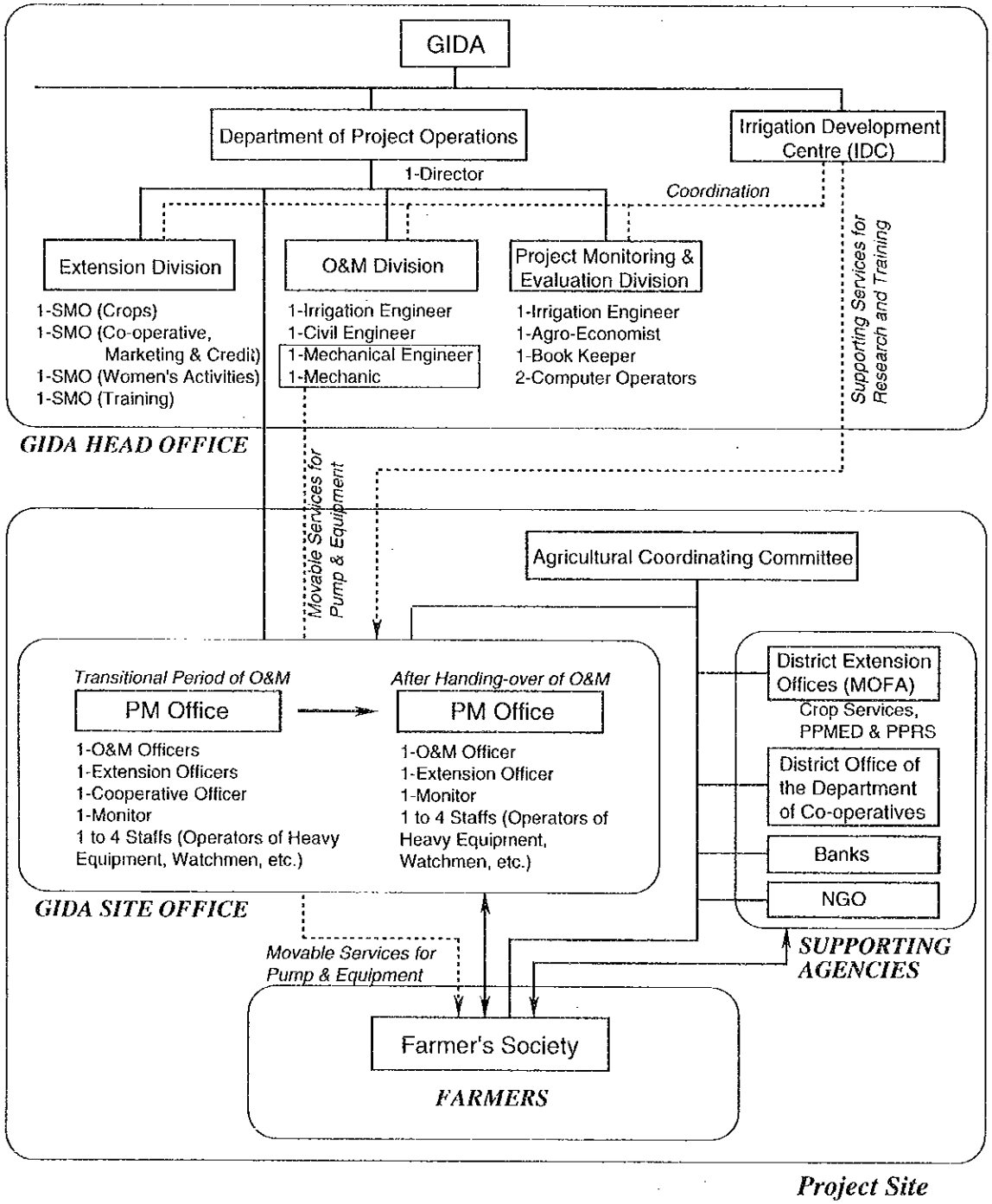

Figure G-5
Proposed Organisational Structure of Executing Agencies for Handing-over of O&M

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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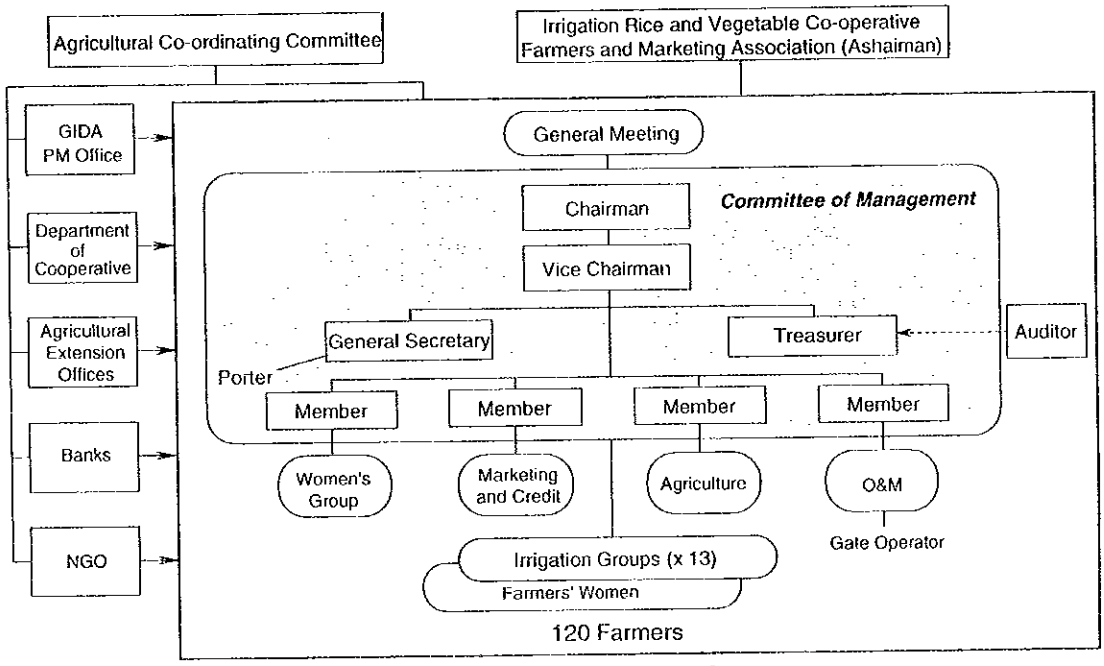
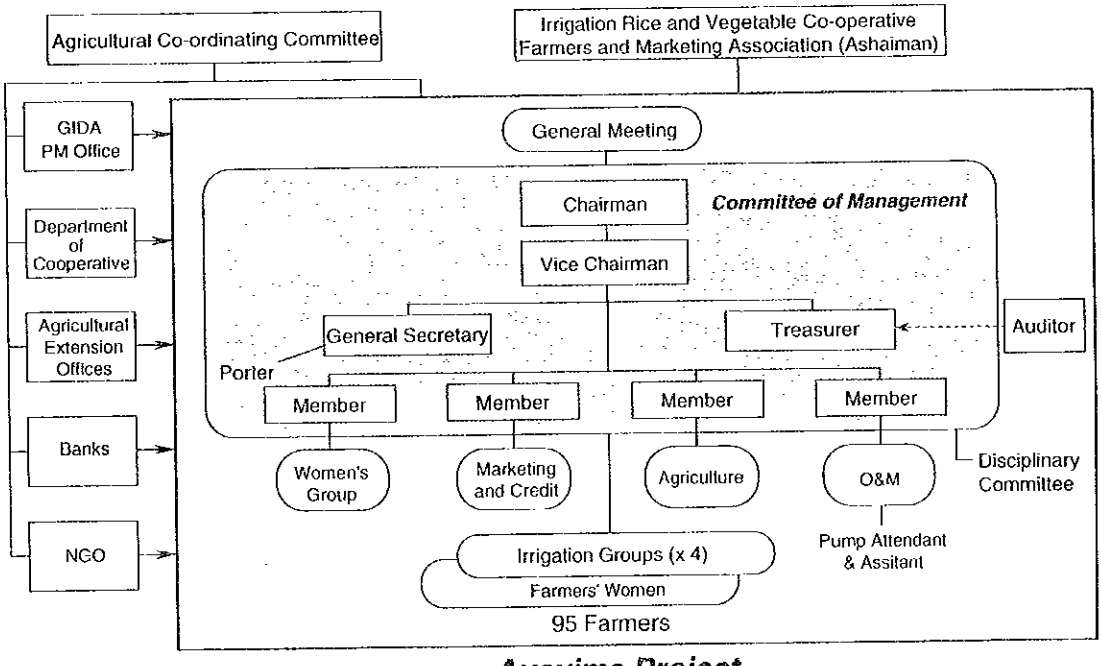


Ashaiman Project

(54 ha)



Aveyime Project

(95 ha)

Figure G-6 (1/4)
Proposed Organisational Structure of Farmers' Societies

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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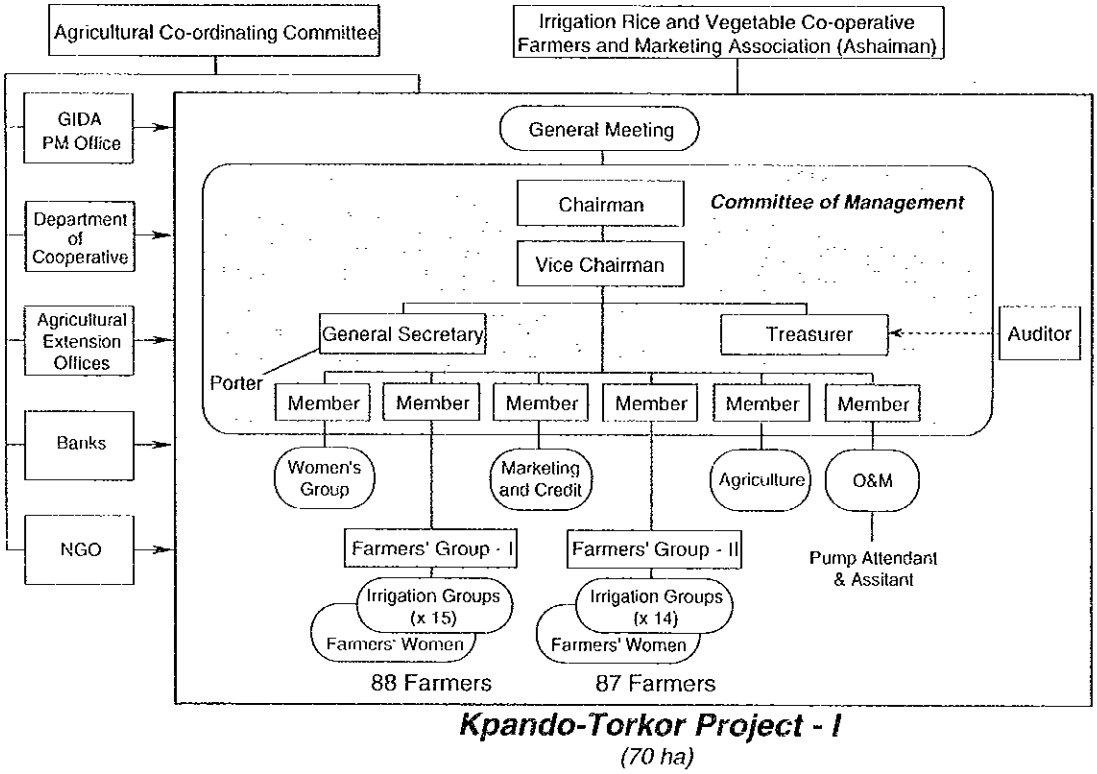
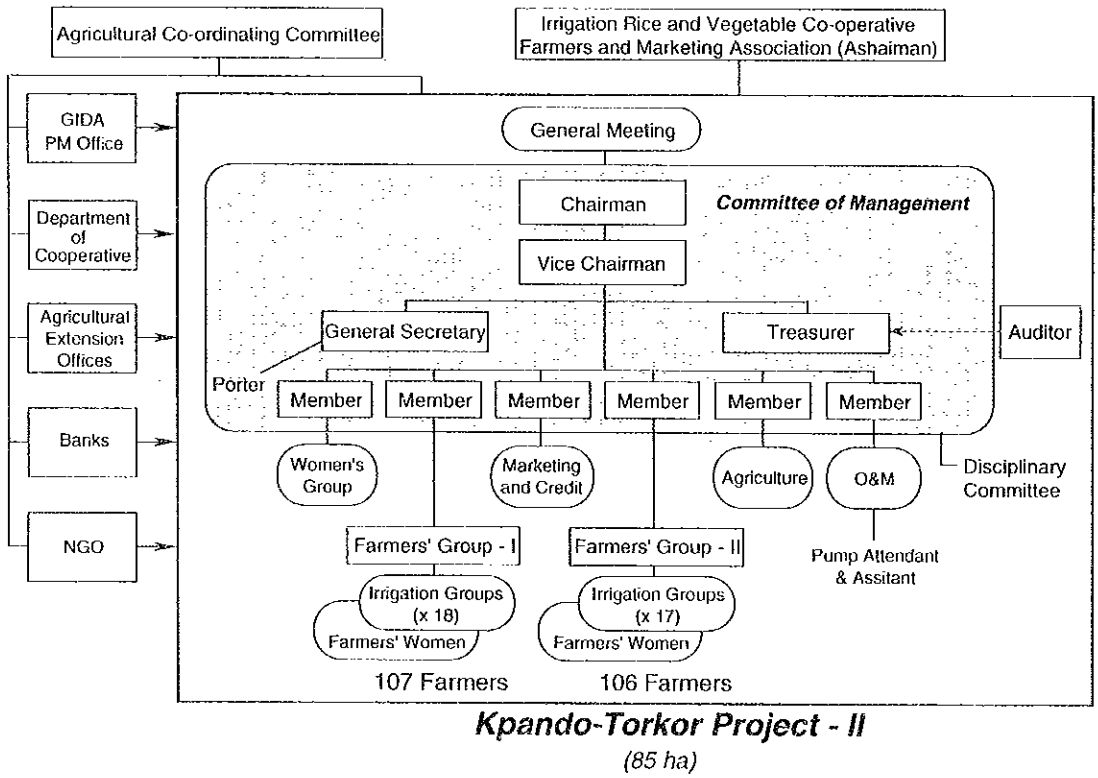


Kpando-Torkor Project - I

(70 ha)



Kpando-Torkor Project - II

(85 ha)

Figure G-6 (2/4)
Proposed Organisational Structure of Farmers' Societies

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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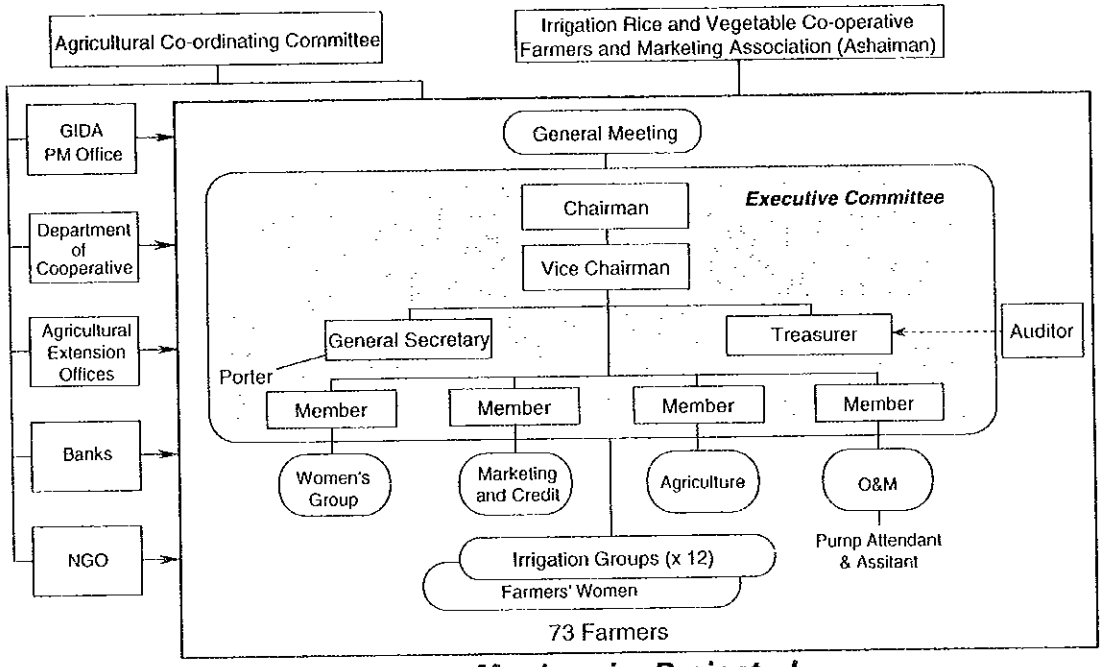
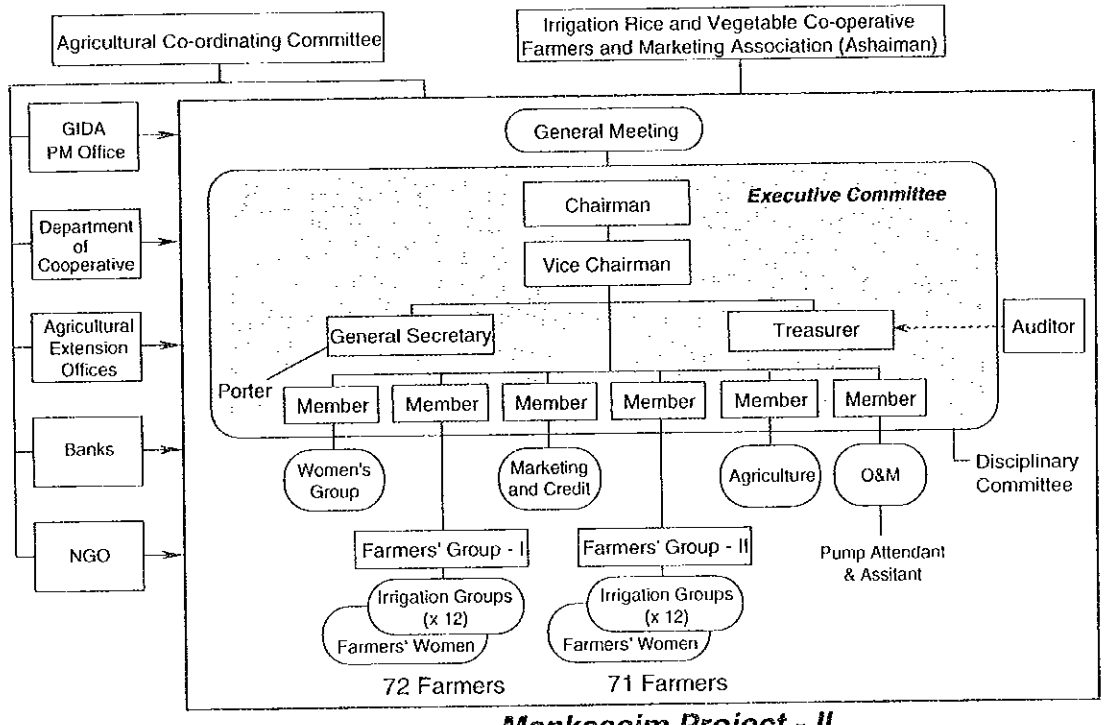


Mankessim Project - I

(29 ha)



Mankessim Project - II

(57 ha)

Figure G-6 (3/4)
Proposed Organisational Structure of Farmers' Societies

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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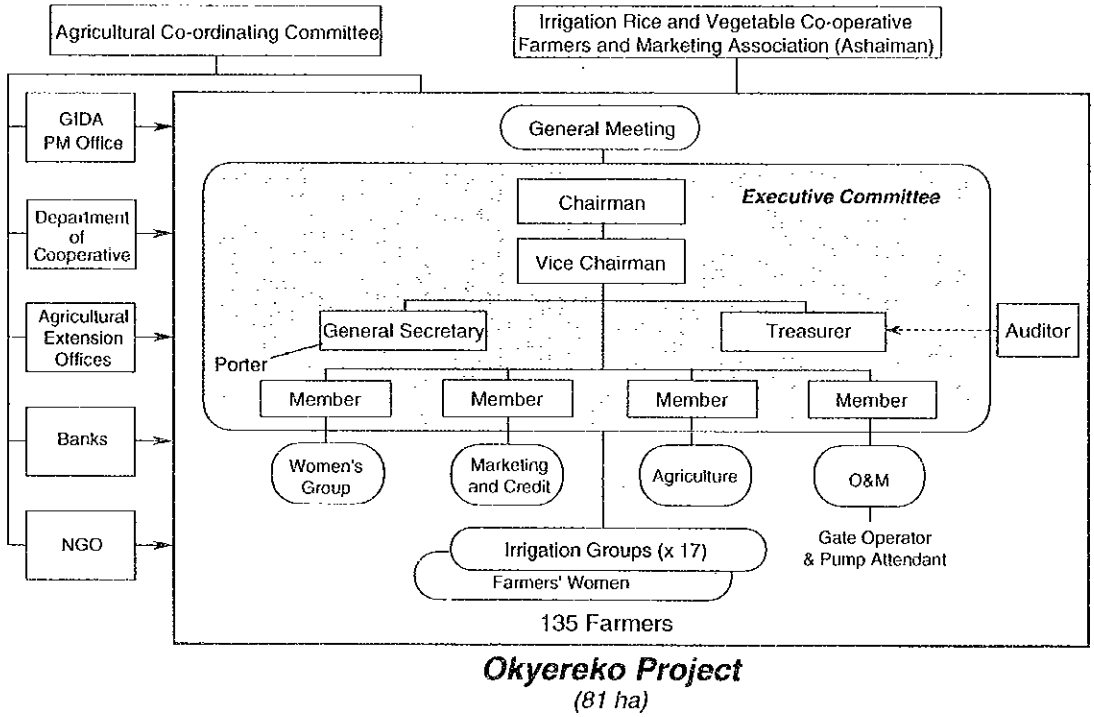

Okyereko Project
(81 ha)

Figure G-6 (4/4)
Proposed Organisational Structure of Farmers' Societies

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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Figure G-7
Sample of Cropping Calendar (Rice Cultivation)

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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