

## CHAPTER 5

### WUA SUPPORTING PROGRAM IN MEKI (PROGRAM II)

#### 5.1 Objectives

Program II was carried out with the following objectives;

- 1) Rationalization of community-based irrigation development procedure in Meki by referring to the experience and performance in the verification study of the Meki study.
- 2) Provision of technical support for establishment of new WUAs at five locations according to the rationalized procedure.

#### 5.2 Selection of WUA Candidates

##### 5.2.1 Applications

Community-based irrigation schemes have been developed in Meki since the late 1990s. As of April 2003, 18 WUAs including three WUAs of the Shubi-Sombo schemes were established and technically assisted by the OIDA Meki office.

Given information about successful performance of the Shubi-Sombo schemes, 52 farmers' groups submitted applications to the OIDA Meki office. The main factors behind the motivation of the applicant farmers are summarized into four factors, namely (i) presence of repeated drought and erratic rainfall; (ii) presence of a water source for irrigation farming; (iii) unfair and insufficient realization of benefit through current contracted irrigation farming with private pump owners; and (iv) presence of an opportunity to obtain a pump for collective irrigation farming purposes through OIDA with the assistance of JICA. All the applications were prepared by groups with lists of individual farmers. All the applications were authorized with official stamps of the relevant PA chairmen.

##### 5.2.2 Selection Criteria

In order to select five applications from among the 52 applications, the selection criteria are set up as follows.

- 1) Location: Dugda Bora wareda
- 2) Water sources: the Ziway lake or groundwater
- 3) Physical conditions:
  - Pump capacity: around 10 hp
  - Canal length: not longer than 500 m

- Related structures: no special structures such as aqueducts, siphons, etc. required for easy O&M suitable for local farmers.
  - Sufficient water discharge and suitable water quality
- 4) Sociological conditions: The farmers groups should be:
- Strengthened in their unity,
  - Fairly formed and democratically managed,
  - With strong leadership, and
  - Organized by youths, the majority of whom can accept modern farming technologies.

The Study placed emphases on the management capacity of the candidate groups. A priority was given to groups that were expected to become leaders among rural communities as model schemes with high performance, which would be encouraging for other groups. The Study also paid special attention to diversification of water sources. The only water source of the Shubi-Sombo schemes is the Meki river. To examine possibilities of alternative water sources, groups, which would utilize either the Ziway lake or groundwater, were prioritized in the selection.

### 5.2.3 Selected Communities

The JICA Study Team in collaboration with the OIDA Meki office carried out the interview and field inspection in May 2003. Finally, the following five groups were selected.

**Selected Five Communities for Program II**

No.	Peasant Association	Water source	WUA (HH)	Area (ha)	Dist. From Meki (km)
1	Tuchi Dembel	Ziway	19	4.75	16
2	Abono Gabriel	Ziway	50	7.00	11
3	Welde Mekdele	Ziway	21	5.25	11
4	Taticha Elan	Groundwater	24	5.00	32
5	Dodo Wadaraa	Groundwater	23	5.00	20
Total			137	27.00	

## 5.3 Basic Conditions of Pump Use Management

### 5.3.1 Conditions stipulated under the Meki Study

During the Meki study, an optimum approach to a small pump irrigation development was studied and conceptualized into a form of standardized approach, which is constituted by the following main ingredients;

- a) Numbers of households for WUA : 20 households;
- b) Size of command area : not more than 5.0 ha
- c) Size of irrigation farming plot : 0.25 ha per household;

- d) Water lifting device : Pump
- e) Capacity of a pump : 10 horse power (HP)
- f) Financial policy : Cost recovery for replacement of pumps
- g) Financial implementation modality : Formation of WUA's group fund
- h) Size of initial capital cost : Birr 80,000 per scheme at maximum

The Meki study advised groups to share the limited land at the rate of 0.25 ha per HH as maximum size of land holding. There are three main reasons for this policy, namely (i) maximization of the number of memberships for WUA; (ii) equitable distribution of farm plots for irrigation; and (iii) optimum performance and efficiency of irrigation farming by using a small pump of around 10 hp. These concepts were also supported by Oromia Regional Proclamation no. 56/1994, which was issued in 2001 to control the land holding size to be less than 0.5 ha per HH under irrigation projects implemented by public organs.

### 5.3.2 Premises

In line with the above-mentioned conditions under the Meki study, additional discussions were conducted on project cost-sharing. The cost-sharing principles employed are highly compatible with the modality of development projects prevailing in this country. The representative of the implementation modality to be referred to is the Ethiopian Social Rehabilitation and Development Fund (ESRDF) whose modality has been widely adopted on a nationwide scale by woreda administrations as well as peasant associations.

Before 2002, user communities of ESRDF were obliged to share 10 % of investment cost in both cash and kind and also covered expenses for pre-feasibility study cost. This condition was slightly modified. ESRDF currently provides each WUA with a minimum amount of farm inputs, like seeds, as a grant only after the irrigation scheme is officially handed over to the community. This change is because WUA normally faces difficulties to be sufficiently engaged in irrigation farming due to no availability of farm inputs. The value of farm inputs is roughly estimated to be around 5 % of total investment cost.

The initial investment for one scheme is estimated to be Birr 80,000 under Program II. If the current ESRDF's modality on cost sharing can apply to this case, 5 % is Birr 4,000, which can be converted into 400 man-days of labor inputs at daily wage of Birr 10. It is deemed suitable for each beneficiary to contribute his/her family workforce for 20 days (400 man-days for 20 HH). It was also expected that these contributions would motivate their accepting ownership of the project. Paying particular attention to cost sharing of the projects, it was decided to formulate project premises consisting of the following 11 conditions.

### Basic Conditions of Agreement on Pump Use Management (Premises)

- |                                     |   |
|-------------------------------------|---|
| 1) Ultimate Goal of Agreement       | : Food Security – Stability of and Increase in Agricultural Production by user household through irrigation farming |
| 2) Main Stakeholders in Agreement   | : OIDA, Water Users Association and Peasant Association   |
| 3) Specific Scope of Agreement      | : Pump Use Management in Irrigation Farming<br>(Implying no support to farm inputs is provided)                     |
| 4) Type of Agreement                | : Lease Agreement   |
| 5) Basic Pumping Rights             | : Pump ownership held by OIDA<br>Usufruct right enjoyed by WUA  |
| 6) Item in Lease Agreement          | : Pump for Irrigation Use Only  |
| 7) Cancellation of Agreement        | : Can be cancelled due to Violation or Unjustifiable Application of Agreement                                       |
| 8) Basic Principles of Lease        | : One Time Investment of Pump by OIDA, Cost Recovery by WUA   |
| 9) Contributions by WUA             | : Physical contributions with 400 man-days by WUA<br>(5 % of investment cost)                                       |
| 10) Operational Conditions of Lease | : Effective, Efficient and Sustainable Use and Management of Pump by WUA  |
| 11) Water Resources                 | : Construction and Maintenance of Lead Canals to the Site and Wells under WUAs' Responsibility                      |

## 5.4 Procedures

### 5.4.1 Participatory Rural Appraisal (PRA)

The main objective of PRA is formulation of a participatory plan for community-based irrigation development with candidate WUA members under the above-mentioned premises. Farmers' preferences were listened to as much as possible in order to incorporate them to the final plans. At each step of discussion, however, both OIDA and applicants reserve the rights to terminate or cancel the discussion when one or both sides cannot agree the conditions arising from the PRA.

### 5.4.2 Principles in Physical Plan and Design

As a nature of the participatory development, the physical plan and design are, in principle, formulated according to the farmers' preference. PRA was the most important step, not only in terms of community mobilization, but also optimum plan and design. However, it is often difficult for farmers to have realistic images of irrigation facilities to be constructed. In order to reflect farmers' preference to the final plan as much as possible, the JICA Study Team listened to their opinions from time to time even after the commencement of the construction. The basic concepts

for preparation of the physical plans and designs are summarized below.

- 1) Existing resources, e.g. canals and ponds, shall be fully utilized for new irrigation systems.
- 2) Basic layout plan shall be drawn by applicants. Layout plan shall indicate water sources, location of pump, canals, related structures, farm plots and water delivery system.
- 3) Water for irrigation shall be made available on site by applicants. Lead canals from the Ziway lake and dug-wells shall be constructed by applicants.
- 4) Local materials shall be utilized for construction of irrigation facilities and pump houses as much as possible so as to ensure cost-saving and easy maintenance.
- 5) Models of pumps shall be selected by OIDA taking easy maintenance, after-sale service by suppliers and availability of spare parts into consideration.
- 6) Pump and canal capacities shall be adjusted taking into account reasonable allowance for farmers' capability in irrigation water management.

## **5.5 Performance of Program II**

### **5.5.1 Overall Performance**

Program II was implemented according to the following steps.

#### **Procedure of Community-based Irrigation Development**

- |         |   |
|---------|---|
| Step 1  | Confirmation of member farmers of an applicant group and their attitude to the community-based irrigation development |
| Step 2  | Proposal of farmers, including water resources and layout plan  |
| Step 3  | Land ownership and holding size of farmers with proposals for land exchange among farmers                             |
| Step 4  | Presentation of the premises by OIDA  |
| Step 5  | Basic agreement on farmers' responsibilities for operation and maintenance of pump and facilities                     |
| Step 6  | Topographic survey  |
| Step 7  | Engineering study on basic irrigation plans on the basis of farmers' proposal   |
| Step 8  | Agreement on establishment of water users association (WUA)   |
| Step 9  | Procurement and installation of a pump including construction of a pump house   |
| Step 10 | Construction of irrigation canals and on-farm facilities  |
| Step 11 | Training for pump operation and maintenance   |
| Step 12 | Handing-over of irrigation facilities   |

All the activities of Program II were smoothly performed in the reporting period from May 2003 to February 2004 by the joint efforts of OIDA and the JICA Study Team. Finally, six communities from No. 1 to No.6 in the following table achieved establishment of WUAs at five sites.

**Community-based Irrigation Schemes in Dugda Bora Wareda (Meki)**

No.	WUA	PA	Members			Irrigat. Area (ha)	Source of Water	Year of Establishment	Donor / NGO
			Male	Female	Total				
1.	Oda Chisa	Welde Mekdele	19	2	21	5.25	Ziway	2003	JICA
2.	Bade Gosa	Tuchi Dembel	16	3	19	4.75	Ziway	2003	JICA
3.	Oda Bilbila	Abono Gabriel	15	3	18	4.50	Ziway	2003	JICA
4.	Taticha Elan	Dodo Wadara	11	1	12	3.00	G.water	2003	JICA
5.	Taticha Golbaa	Dodo Wadara	9	3	12	3.00	G.water	2003	JICA
6.	Kenteri Michael	Dodo Wadara	18	6	24	6.00	G.water	2003	JICA
7.	Shubi	Shubi Gamo	15	2	17	5.8	Meki	2001	JICA
8.	Sombo Genet	Shubi Gamo	18	5	23	6.3	Meki	2001	JICA
9.	Sombo Aleltu	Shubi Gamo	13	7	20	5.0	Meki	2001	JICA
10.	Tuchi Dembel	Tuchi Dembel	16	1	17	8.0	Ziway	1996	SHI
11.	Wayyo Gabriel	Wayyo Gabriel	17	5	22	13.8	Ziway	1996	SHI
12.	Wayyo Serriti	Wayyo Gabriel	42	5	47	17.0	Ziway	1999	ESRDF
13.	Dodoata Denbel	Dodota Denbel	15	-	15	10.5	Ziway	1997	SHI
14.	Cheleleka Denbel	Dodota Denbel	26	0	26	10.9	Ziway	1998	SHI
15.	Teppo-140	Teppo Chareke	42	4	46	13.0	Ziway	1997	
16.	Meki-Ziway	Bekere GIRRISA	(332)	-	332	216.0	Ziway	1997	Gov.
17.	Meilka Korma	Welda Korma	15	6	21	16.8	Ziway	1998	SHI
18.	Melka Aba Godana	Welda Kelina	12	1	13	7.8	Meki	1998	SHI
19.	Lega Meki-1	Shubi Gemu	12	-	12	32.5	Meki	1997	
20.	Lega Meki-2	Bekere GIRRISA	19	5	24	6.0	Meki	1998	
21.	Oda Bokota	Oda Bokota	-	23	23	5.0	Meki	1999	SHI
22.	Jara Wayu	Elen	20	5	25	8.1	Elen	1998	Gov.
23.	Melka Cherecha	Welda Mekdele	34	-	34	14.1	Ziway	1998	
24.	Kelina Denbel	Wedia Kelina	15	1	16	8.6	Ziway	1998	
Total			751	88	839	431.7			

Source : OIDA Meki Office

Remarks : Gov. indicates government, SHI-Self Help International

As a result, the community-based irrigation schemes in Dugda Bora expanded from 405.2 ha (733 HH) in April 2003 to 431.7 ha (839 HH). The performance of Program II for each of the six WUAs is presented in Annex IV on the WUA Supporting Program in Meki (Program II) and summarized in the following paragraphs.

## 5.5.2 Oda Chisa WUA in Welde Mekdele PA

### (1) Background of the community

This WUA was organized in Welde Mekdele PA, located on the north shore of the Ziway lake 11 km from Meki town. The community has experienced historical transmigration from the small island in the Ziway lake to the current locality. In 1997, around 10 HHs of the community constructed a lead canal 500m long from the Ziway lake to the locality. Contract farming was initiated between an informal group of seven HHs and two pump owners. The first one operated irrigation farming from 1998 to 2002, while the second pump owner entered to contact with farmers from 2002 to November 2003. These private owners provided farmers with minimum operation inputs like fuel and lubricants. The farmers were engaged in crop production using half the area of their farm plots. In return, the pump owners were given the right to use the other half of the farm plots in which highly valued commercial vegetables like tomatoes and onions were produced.

This area suffered from droughts in 1999 and 2000. Such a calamity called for, at least an expansion of the informal group involving other households in the same locality, demonstrating two tangible results. One was the reality that irrigation farming succeeded in agricultural production even during drought, while the other was the total failure of rain-fed farming with no products.

As a consequence of the above, local people in Oda Chisa, including seven HHs of the informal group, made their first application, dated 24 September 2001, to OIDA through the wareda office for provision of a pump for collective irrigation.

### (2) Focal points in PRA

On the basis of the irrigation plot layout, it was identified that most of farm plots to be irrigated were owned by a limited number of farmers, i.e. 4.25 ha only by four farmers. The JICA Study Team firstly paid attention to how to settle internal land exchange as the most critical issue of this community prior to PRA. With reference to monitoring results on Shubi-Sombo schemes, the first attempt to involve PA officials in a process to legitimize the internal land arrangement of WUA.

The locality of the community is highly advantageous in terms of irrigation development since the Ziway lake is located within 500 m of the village center and flat alluvial soils on the lakeshore seem fertile and suitable for intensive vegetable production. In contrast, the accessibility from the village to the Meki market is too poor to transport their products. PRA was directed to verify financial viabilities taking the difficult marketing situation of the Oda Chisa WUA into consideration.

### (3) Project Implementation from May 2003 to February 2004

The establishment of Oda Chisa WUA and construction of their scheme facilities is summarized below.

14 May 2003	:	Confirmation of group intention
27 May 2003	:	Site inspection
10 June 2003	:	PRA1 for confirmation of WUA membership
13 June 2003	:	PRA2 for preparation of a layout map
14 June 2003	:	Topographic survey
17 June 2003	:	PRA3 for presentation of premises
24 June 2003	:	PRA4 for draft agreement
1 July 2003	:	PRA5 for agreement and exchanging opinions on the farming plan
2 July 2003	:	PRA6 for confirmation of the final plan (commencement of construction)
9 August 2003	:	PRA7 for re-clarification on cost sharing
4 September 2003	:	Installation of pump
8 November 2003	:	Completion of construction
9 November 2003	:	Trial operation
13 November 2003	:	Handing-over

A series of the PRA sessions was smoothly performed. The construction was started on 2<sup>nd</sup> July 2003 and substantially completed on 8th November 2003.

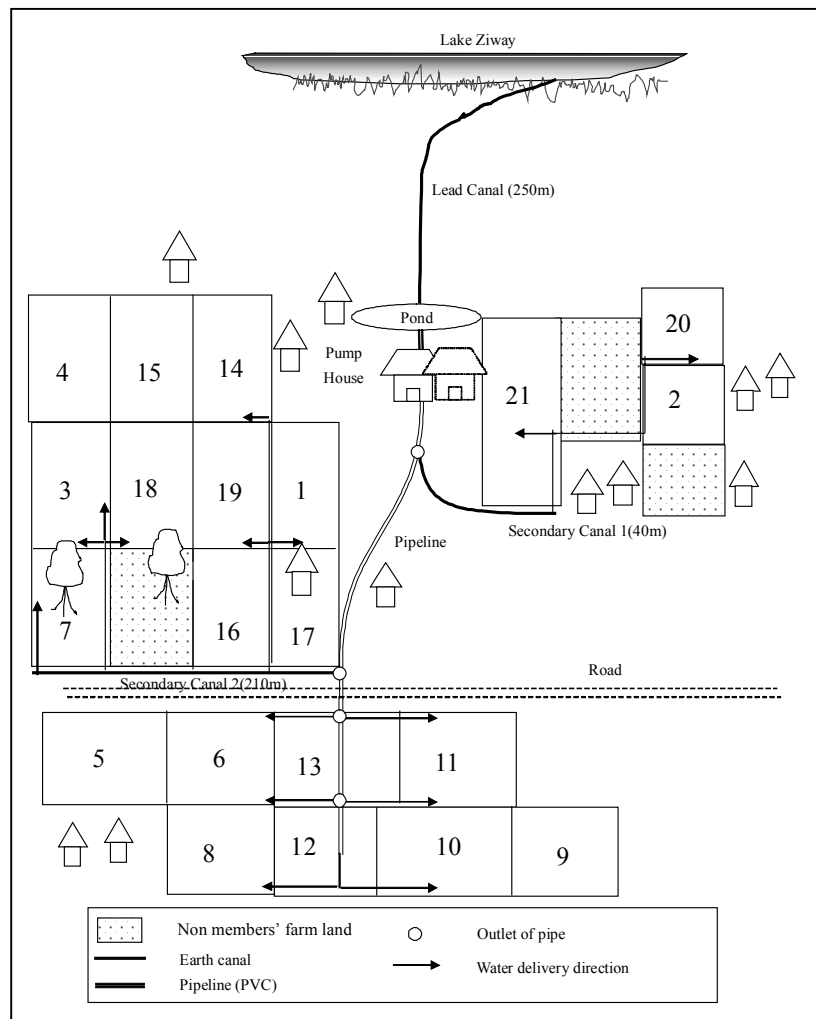
The land exchange was an important issue for Oda Chisa. Four members owned farm plots of more than 0.25 ha along the proposed main and secondary canals, i.e. one having 1.25 ha and three having 1.00 ha. Those four members were advised to re-allocate the 4.25 ha to other members. Through PRA, out of 4.25 ha, 1.75 ha were exchanged with seven members and 1.25 ha were transferred to five members.

The internal arrangements of land exchange were officially acknowledged by the PA Chairperson. For this reason, one of the executive members of the PA was asked to attend every PRA session so that the consultations and discussions could be monitored by the PA in terms of the legal aspects. The members were requested to prepare a note for each internal agreement on land exchange/transfer. According to the instruction, a newly elected Secretary of Oda Chiisaa prepared note memorandums for this purpose. Every note memorandum prepared was signed by the PA Chairperson with its official seal, after examining each case. Six sets of documents, including the originals were prepared and distributed to OIDA Head Office, OIDA Wareda Office, Oda Chisa WUA, Dugda Bora Wareda Office, Welde Mekdale PA and the JICA Study Team. Separately from the above copies, one copy for each individual household concerned was handed over for their records.



(4) Layout map

The layout map of the Oda Chisa scheme is illustrated below:



**Layout Map of Oda Chisa Scheme**

5.5.3 Bade Gosa WUA in Tuchi Dembel PA

(1) Background of the community

The project site is located on the western shore of the Ziway lake 16 km south of Meki town along the Meki-Awasa highway. Most of the community members have experienced transmigration from some parts of Shoa. Besides, many of the members currently reside in the nearest towns including Meki, Abosa and Ziway. But they are officially recognized members of the PA since they keep holding farmlands within the territory of the PA. The community is, to some extent, characterized as a network-oriented society rather than geographically based society. The area has been continually covered by the famine relief program under the Disaster Prevention and Preparedness Bureau (DPPB) of the Oromia State. Due to frequent droughts, food insecurity is one of the core incentives to motivate local people towards intensive

irrigation farming.

The PA has access to the water source through lead canals from the Ziway lake. The members of the WUA were allocated collective farm plots 1.12 km from the lake. Their farmlands are severely dried and susceptible to soil erosion. Soils seem less fertile and are left as fallow for long periods. However, next to their farm plots, private pump owners produce high value crops such as tomatoes and onions. This situation motivated the WUA members. The members mobilized themselves in the year 2000 to construct a lead canal but it was not completed.

Out of 20 members, 12 have been engaged in irrigation farming with the private pump owner stationed in Addis Ababa. They have learnt the negative aspects of private-led farming, in which the private owner provided members with (i) pump, (ii) farm inputs including seeds, fertilizers, agro-chemicals and diesel, (iii) transportation means, and (iv) agronomic advice. At harvest, the owner collected all products to sell in Addis Ababa, and in return the owner gave them back cash.

## (2) Focal points in PRA

The WUA members expressed their views that they were always in an underprivileged position in transactions of product sale. They have no access to any market information on actual transactions, not even the actual selling price of tomatoes in Addis Ababa. Inaccessibility to market transactions has discouraged them.

Special attention was paid to risk of future intervention by private pump owners to WUA members even after they would obtain their own pump. The intention of the members to improve the relationship with private pump owners and middlemen was carefully listened to through the PRA sessions.

The construction of a lead canal was also an important issue in PRA. The total length of the lead canal was estimated to be 1.12 km requiring a labor input of 350 man-days. Preservation of the water source was under the responsibility of the WUA members. The members' intentions toward this requirement were confirmed.

## (3) Project Implementation from May 2003 to February 2004

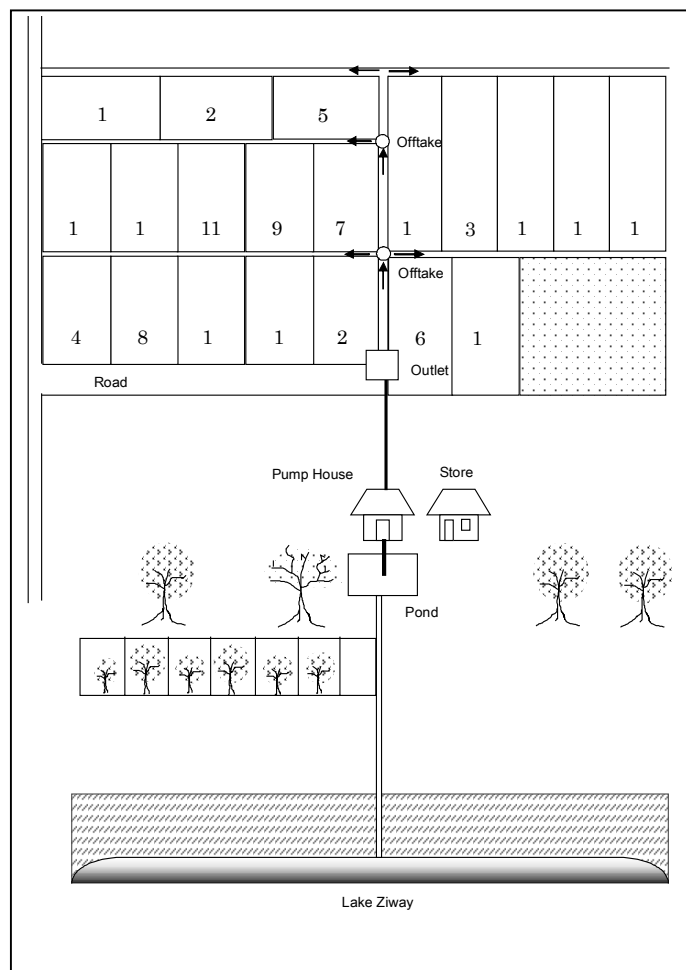
The establishment of Bade Gosa WUA and construction of their scheme facilities is summarized below.

13 May 2003	:	Confirmation of group intention
27 May 2003	:	Site inspection
10 June 2003	:	PRA1 Membership
13 June 2003	:	PRA2 Layout map
14 June 2003	:	Topographic-survey

- 20 June 2003 : PRA3 Premises
- 27 June 2003 : PRA4 Physical plan
- 1 July 2003 : Setting alignment of lead canal
- 2 July to 7 August 2003 : Excavation of lead canal by farmers group
- 15 August 2003 : PRA 5 Land arrangement
- 27 August 2003 : PRA 6 Financial management
- 2 September 2003 : PRA 7 Draft agreement
- 6 September 2003 : PRA 8 Agreement
- 7 September 2003 : Commencement of construction
- 8 October 2003 : Installation of pump
- 10 November 2003 : Completion of construction
- 11 November 2003 : Trial operation
- 12 February 2004 : Handing-over

(4) Layout map

The layout map of the Bade Gosa scheme is illustrated below:



**Layout Map of Bade Gosa Scheme**

#### 5.5.4 Oda Bilbila WUA in Abono Gabriel PA

##### (1) Background of the community

The project site is located in Abono Gabriel PA about 14 km south of Meki town and 3 km from the Meki-Awasa highway towards the Ziway lake. The PA is situated immediate north of Tuchi Dembel PA. Despite this, the community is characterized as a geographically based society since all the members reside together in the PA. This PA suffers from erratic rainfalls and repeated drought. As seen in Bade Gosa WUA of Tuchi Dembel PA, contract farming is quite prevalent. The community owned the existing lead canal from the Ziway lake to the locality, which was inherited from a previous generation, but the canal was quite old. The canal was used by private pump owners contracting with some of the WUA members for vegetable production. The members were motivated to have their own pump.

##### (2) Focal points in PRA

It was verified through the first PRA session that most of the WUA members are quite aged. Out of 18 members, four are over 60 years old resulting in an average of 50.7 years old. The candidate communities under Program II should preferably be future leading communities organized by a majority of youths who can accept modern farming technologies.

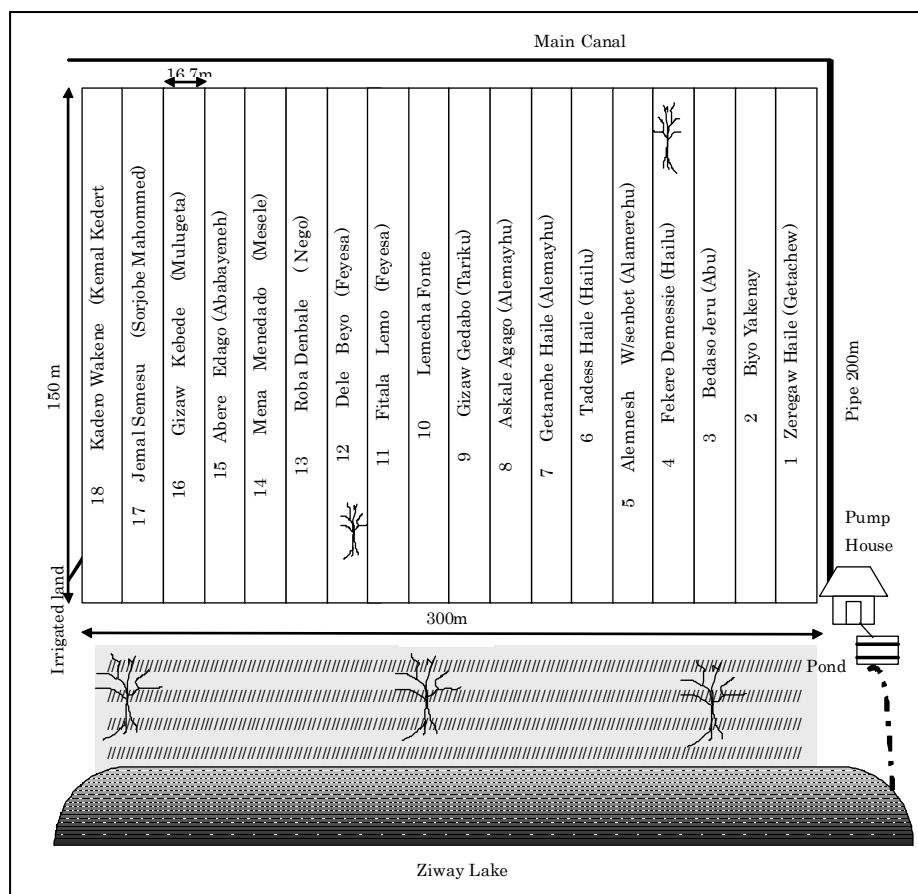
##### (3) Project Implementation from May 2003 to February 2004

The performance for establishment of Bade Gosa WUA and construction of their scheme facilities is summarized below.

13 May 2003	:	Confirmation of group intention
15 October 2003	:	PRA1 Membership
18 October 2003	:	PRA2 Membership, Layout map
22 October 2003	:	PRA3 Premises
28 October 2003	:	PRA4 Premises
5 November 2003	:	PRA5 Internal agreement
15 November 2003	:	PRA6 Agreement with OIDA
16 November 2003	:	Commencement of construction
12 February 2004	:	Installation of pump
27 February 2004	:	Completion of construction
28 February 2004	:	Trial operation

##### (4) Layout map

The layout map of the Oda Bilbila scheme is illustrated below:



**Layout Map of Oda Bilbila Scheme**

### 5.5.5 Taticha Elan WUA and Taticha Golba WUA in Dodo Wadara PA

#### (1) Background of the community

Taticha Elan is located near the Elan lake, from which local people acquire water for drinking purposes. In geohydrological connection with the Elan lake, it has been found through sporadic but locally initiated efforts that groundwater can be available through hand-dug wells. Those hand-dug wells were normally maintained by either a small group of neighboring households or an individual household. Empirical knowledge on availability of groundwater formed the immediate factor for their motivation to irrigation farming. The other related factor was the involvement of private pump owners who reside in the nearest town of Kenter, 3 km distant from Taticha Elan. In addition to private pump owners, this area became attractive for middle merchants from Addis Ababa. Through such active interactions with external actors of the private sector, new area characteristics in terms of commercial values were eventually known to the local people in Taticha Elan.

Local people in Taticha Elan started analyzing the patterns of their present transactions with the private sector, in which they found it necessary or desired to deduct the cost of rental fees. The local people were involved in irrigation farming through (i) contract farming on the one hand and (ii) rental arrangement for the pump

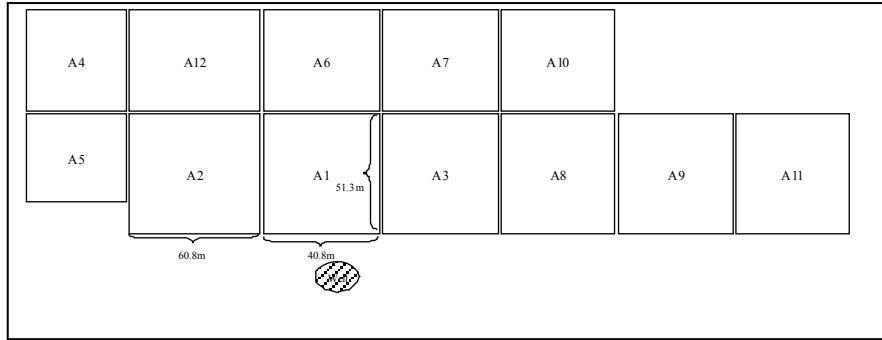
on the other hand. Individual farm households organized themselves into an informal group for irrigation farming. Such an informal group elects their leader whom the middle merchants from Addis Ababa contact and make an agreement for production of certain crops for sale to them. Within the agreement, middlemen provide the informal group with money to be used for renting pumps, hiring laborers, purchasing seeds and fuel and other related production expenses. The middlemen normally contacted the informal group on a weekly basis for monitoring progress of production. Under such arrangement, it could be observed that agricultural production costs were somehow secured through the middlemen although it might be anticipated that individual farmers might sometime have debts due to crop failure or lower selling prices. It was also said that farmers could have security to sell their products to the contracted middlemen.

As a result of local perspectives on this transaction, an interested group of people expressed their views that cost reduction of pump rental fees was an immediate focus with an expectation of more economic gain. In this context, local farmers who have the most experience in irrigation farming made an application for the provision of a pump by organizing themselves for establishment of a WUA.

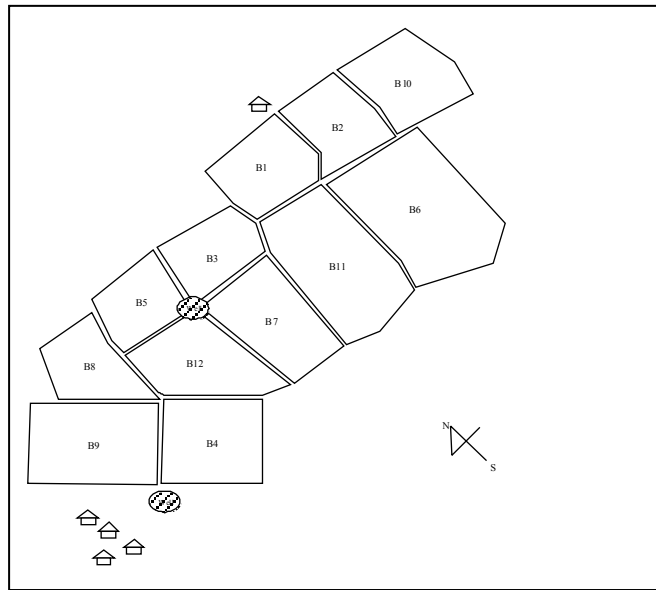
## (2) Layout maps

The WUA applicants divided themselves into three sub-groups, each of which consists of around 12 applicant members. They were asked to draw their intended physical layout on paper. They were given one week for preparation.

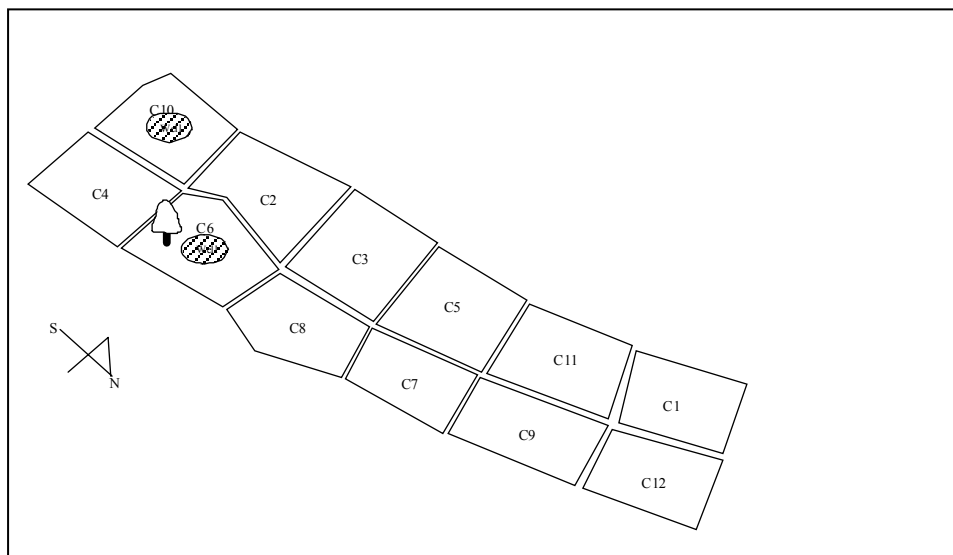
In the second PRA session on 2nd July, they presented physical layouts indicating locations of each farm plot to be irrigated, the dug-well, canals, houses and other landmarks. It was found during a walk through, however, that the location of the farm plots in the layout was not correct. Therefore, the respective layouts of the three groups were subject to correction requiring another week for drawing. Through transect walks, WUA applicants were given a minimum of advice on techniques so as to place individual farm plots in order referring to the actual situation. Results of exercises to draw physical layout are shown in figures as below.



**Layout of Farm Plots (Sub-Group A of Taticha Elan)**



**Layout of Farm Plots (Sub-Group B of Taticha Elan)**



**Layout of Farm Plots (Sub-Group C of Taticha Elan)**

(3) Project implementation from May 2003 to February 2004

The PRA and construction in Taticha Elen WUA were carried out as below.

23 May 2003	:	Confirmation of group intention
20 June 2003	:	Site inspection, pumping test
27 June 2003	:	PRA1 Premises
2 June 2003	:	PRA2 Layout map
8 August 2003	:	PRA3 Physical plan, topographic survey
15 August 2003	:	PRA4 Land arrangement
26 August 2003	:	PRA5 Financial management for sub-group A and B and land re-arrangement for sub-group C
5 September 2003	:	PRA6 Financial management, Re-physical plan for sub-group C
9 October 2003	:	PRA 7 Agreement for sub-groups A and B
10 October 2003	:	Commencement of construction
1 November 2003	:	Installation of pump
5 November 2003	:	Completion of construction
11 November 2003	:	Trial operation

The land exchange was not successful among Group C. The agreement was made only for Group A, which was named Taticha Elen, and Group B, Taticha Golba.

#### 5.5.6 Kenter Michael WUA in Dodo Wadara PA

##### (1) Background of the community

The proposed area is situated some 30 km north of Meki town along the main highway from Mojo to Meki. The area is characterized by a high groundwater table, in most places within a range between 5 m and 10 m depth, which is probably related to the water level of Koka Lake and Elen Lake.

With this favorable condition, groundwater irrigation by using handy pumps of around 5 hp is prevailing in the area. Private pump owners and middlemen promote contract farming with local farmers and have played significant roles in introducing relevant farming technologies. However, the majority of local farmers never take part in most decisions related to benefit sharing and can not obtain rational benefits under contract farming. Although most of the farmers realize their unfavorable positions in contract farming, it is highly difficult for individual families to own their own pumps without financial assistance. Because of the above reasons the member farmers organized a group and submitted their application for provision of a handy pump to the OIDA Meki office. The selected group called Kenter Michael was organized by 32 members. The JICA Study Team requested that the group be split into two sub-groups in order to adjust the acreage to be irrigated by the capacity of one pump.



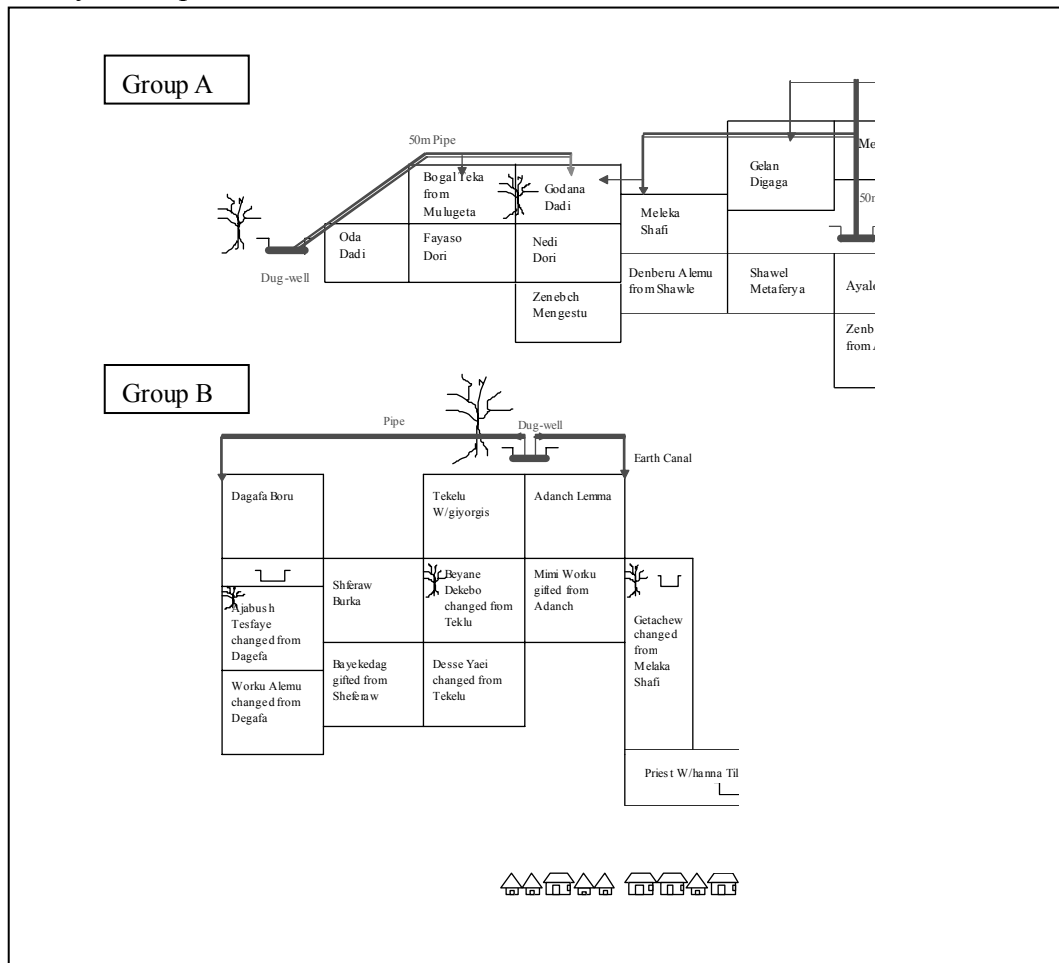
(2) Project implementation from May 2003 to February 2004

The PRA and construction in Kenteri Michael WUA were carried out as below.

- 17 October 2003 : PRA1 Confirmation of application and premises
- 23 October 2003 : PRA2 Members and land arrangement
- 30 October 2003 : PRA3 Land exchange and cost sharing
- 6 November 2003 : PRA4 Physical plan
- 14 November 2003 : PRA5 Financial management
- 20 November 2003 : PRA6 Election of WUA Board Members
- 22 November 2003 : PRA 7 Agreement
- 23 November 2003 : Commencement of construction
- 5 January 2004 : Installation of pump
- 10 January 2004 : Completion of construction
- 12 January 2004 : Trial operation

(3) Layout map

The layout map of the Kenteri Michael scheme is illustrated below:



**Layout of Farm Plots (Kenteri Michael)**

## 5.6 WUA Training

WUA training consists of the following three training aspects.

- 1) Training on operation and maintenance of diesel engine pumps
- 2) Training on WUA management (preparation of by-laws)
- 3) Training on financial management

The training was provided to six WUA by OIDA to carry out sustainable pump and WUA management by applying the training manuals prepared by the JICA Study Team in cooperation with OIDA. The details are presented in Annex IV on the WUA Supporting Program in Meki (Program II).

## 5.7 PBME of WUAs Established under Program II

### 5.7.1 Methodology and Activities

The 1st PBME was conducted for six new WUAs to assess the sustainability of community-based irrigation development in Meki. A questionnaire survey was carried out for both WUA boards and WUA members. The surveys were carried out by the JICA Study Team and the OIDA Meki office over 20 days from 19<sup>th</sup> May to 7<sup>th</sup> June 2004. The data compilation was done at the Meki office with aid of the computer introduced by JICA. The details are presented in Annex IV on the WUA Supporting Program in Meki (Program II).

### 5.7.2 WUA Management

The current conditions of the six WUAs are described below:

**General Description of WUAs**

Description	Oda Chisa	Bade Gosa	Oda Bilbila	Taticha Elan	Taticha Golba	Kenteri Michael
Water Source	Ziway Lake	Ziway Lake	Ziway Lake	Ground-water	Ground-water	Ground-water
Pump Capacity (HP)	12.5	12.5	12.5	5.0	5.0	5.0 (2 units)
Canal Length (m)	Pipe:240 m	Pipe:40m Earth canal: 140m	Pipe:200m Earth canal: 300m	Pipe:200m	Pipe:200m	Pipe:200m
Command Area in Dec 03 (ha)	5.25	4.75	4.50	3.00	3.00	6.00
Command Area in May04 (ha)	5.25	5.00 (+0.25)	4.50	3.50 (+0.50)	2.75 (-0.25)	6.00
WUA members in Dec 03 (HH)	21	19	18	12	12	24
WUA members in May 04 (HH)	21	19	18	12	10 (-2)	23 (-1)

Six WUAs embarked on irrigation farming in late 2003. The PBME verified that the total membership of the six WUAs reduced from 106 to 103 by the resignation of three members. The reasons for the three members resigning were (i) lost

incentives to WUA activities and (ii) land disputes. Command area was also changed. It was reduced due to the resignation of members and was expanded by allocating farm plots to pump operators as their salary.

In Oda Chisa, which completed harvesting of the 1<sup>st</sup> crop, the total revenue of the WUA was Birr 4,360 of which Birr 1,700 was members' contribution and Birr 1,400 was from selling fuel to members. The total expenditures amounted to Birr 2,338 of which Birr 1,288 was for fuel purchase. It should be noted that the deposit for future pump replacement was Birr 1,080. Although the Birr 1,080 amount is only 43% of the scheduled annual deposit of Birr 2,500, nine out of the 21 members are encouraged to invest for the future.

The fund formation of the Oda Chisa WUA was initiated by the collective wage (Birr 975) credited during the construction period by the JICA Study Team as compensation for their labor contribution above 5% of the total project cost. The most important part of financial management is purchase and sale of fuel for pump operation. Fuel is purchased in bulk by the WUA and sold to the members for their requirements. The selling price of fuel is higher than the purchasing prices to produce a profit to cover the cost of lubricants.

### 5.7.3 Irrigation Water Management and OIDA Support

The irrigation interval is about one week with slight changes among WUAs. Over 80% of the members are satisfied with irrigation water supply to their individual plots, while some 70% of the members of Bade Gosa WUA expressed complaints. No mechanical pump problems were reported so far except for defects in the hand pump of the Kenteri Michael WUA. Acting according to the technical advice by the OIDA Meki office, the WUA chairman traveled to Addis Ababa and procured the necessary spare parts for immediate resolution of the problem. All the WUAs are quite confident with the governmental services provided by the OIDA Meki office. The questionnaire survey verified that the WUAs frequently visit the OIDA Meki office to consult about problems such as land disputes, lack/procurement of farm inputs, mechanical defects of pumps, etc.

### 5.7.4 Irrigation Farming under Program II

#### (1) Crop selection

The main crops are tomatoes, maize and chilies, which represented 81% of the total scheme area. However, the crop selection varied by WUA. The results of the survey are presented below.

### Proportional Extent of Plated Area by Crops

Unit : %

Crop	Oda Chisa	Bade Gosa	Oda Bilbila	Taticha Elan	Taticha Golba	Kenteri Michael	Total scheme area
Tomatoes	5	22	100	0	8	47	34
Maize	0	0	0	86	92	13	24
Chilies	64	12	0	0	0	35	22
Onions	2	33	0	14	0	1	8
Cabbages	18	22	0	0	0	0	7
Other	9	0	0	0	0	4	3
Fallow	2	11	0	0	0	0	2
Total	100	100	100	100	100	100	100

Under the farming contract, the Oda Bilbila WUA was fully covered by tomatoes, while Oda Chisa, Taticha Elan and Taticha Golba WUAs selected maize, which is the cheapest crop among the alternatives. Bade Gosa WUAs selected a mixture of such cash crops as onions, tomatoes, cabbages and chilies.

Onions are a high-input vegetable, while chilies are a low input crop. All the onion farmers used agro-chemicals, fertilizers and hired labor. Agro-chemicals are widely used, not only for onions but also for tomatoes. Hired labor inputs were conspicuous in cabbages and onions, which need intensive labor inputs for harvesting. Some 35% of the members hired either tractors or draft animals for land preparation.

#### (2) Crop budget

The crop budget analysis was made for 1<sup>st</sup> crops in Oda Chisa WUA. The crop budgets are summarized below.

#### Crop Budget Analyses of 1<sup>st</sup> Crop in Oda Chisa WUA (1/2)

Item	Unit	Chili (No.2)	Chili (No.3)	Chili (No.5)	Chili (No.6)	Chili (No.7)	Chili (No.8)
Planted Area	ha/plot	0.19	0.25	0.25	0.25	0.19	0.19
Production	qt	9.0	10.0	8.0	7.7	4.3	4.6
Converted	kg/ha	(4,740)	(4,000)	(3,200)	(3,080)	(2,260)	(2,420)
Selling Price	Birr/qt	45	50	100	240	175	200
Gross Revenue	Birr	405	500	800	1,848	751	918
Seed	Birr	20	21	20	70	34	9
Fertilizers	Birr	0	0	0	50	34	0
Agro-chemicals	Birr	0	125	0	115	94	20
Hired Labor	Birr	0	0	156	174	60	50
Tractor Service	Birr	0	0	0	130	0	68
Ox-cart	Birr	0	0	0	0	15	0
Irrigation (fuel)	Birr	125	250	313	188	187	117
Total Cost	Birr	145	396	489	727	424	264
Net Reserve	Birr/plot	260	104	311	1,121	327	654
Converted	Birr/ha	1,368	416	1,244	4,484	1,721	3,442
	US\$/ha	158	48	144	520	199	399

### Crop Budget Analyses of 1<sup>st</sup> Crop in Oda Chisa WUA (2/2)

Item	Unit	Chili (No.9)	Chili (No.10)	Chili (No.11)	Cabbage (No.1)	Cabbage (No.7)	Cabbage (No.9)
Planted Area	ha/plot	0.19	0.13	0.13	0.25	0.06	0.06
Production	qt	4.6	6.4	3.3	34.6	9.2	6.7
Converted	kg/ha	(2,420)	(4,920)	(2,540)	(13,840)	(15,330)	(11,170)
Selling Price	Birr/qt	223	166	100	60	145	60
Gross Revenue	Birr	1,024	1,054	328	2,075	1,334	402
Seed	Birr	48	20	59	50	12	16
Fertilizers	Birr	93	0	0	100	11	31
Agro-chemicals	Birr	43	62	174	29	31	14
Hired Labor	Birr	66	35	56	0	10	6
Tractor Service	Birr	68	0	0	70	0	0
Ox-cart	Birr	0	10	0	0	5	23
Irrigation (fuel)	Birr	47	94	103	130	66	16
Total Cost	Birr	365	221	392	379	135	106
Net Reserve	Birr/plot	659	833	-64	1,696	1,199	296
Converted	Birr/ha	3,468	6,408	-	6,784	19,983	4,933
	US\$/ha	402	742	-	786	2,316	572

Item	Unit	Cabbage (No.10)	Tomato (No.8)	Tomato (No.11)	Onion (No.11)	Green Bean (No.4)	
Planted Area	ha/plot	0.13	0.06	0.06	0.06	0.25	
Production	qt	2.7	3.0	2.5	10.0	8.2	
Converted	kg/ha	(2,077)	(5,000)	(4,167)	(16,667)	(3,280)	
Selling Price	Birr/qt	60	50	54	150	52	
Gross Revenue	Birr	1,024	150	135	1,500	426	
Seed	Birr	20	3	29	29	75	
Fertilizers	Birr	0	0	0	0	0	
Agro-chemicals	Birr	79	7	87	87	0	
Hired Labor	Birr	35	10	12	16	128	
Tractor Service	Birr	0	0	0	0	0	
Ox-cart	Birr	10	23	0	0	0	
Irrigation (fuel)	Birr	98	43	56	62	125	
Total Cost	Birr	239	86	184	194	328	
Net Reserve	Birr/plot	785	64	-49	1,306	98	
Converted	Birr/ha	6,038	1,066	-	2,522	392	
	US\$/ha	700	124	-	292	45	

### (3) Capacity to pay

The net reserve of each member from each plot of 0.25 ha is summarized below.

#### Net Reserve of 1<sup>st</sup> Crop in Oda Chisa WUA

No. of Members	Crop 1		Crop 2		Crop 3		Total net reserve (Birr)
	Crop	Net reserve (Birr)	Crop	Net reserve (Birr)	Crop	Net reserve (Birr)	
1	Cabbage	1,696					1,696
2	Chili	260					260
3	Chili	104					104
4	Green bean	98					98
5	Chili	311					311
6	Chili	1,121					1,121
7	Chili	327	Cabbage	1,199			1,526
8	Chili	654	Tomato	64			718
9	Chili	659	Cabbage	296			955
10	Chili	833	Cabbage	785			1,618
11	Chili	-64	Tomato	-49	Onion	1,306	1,193

The procurement cost of a pump is Birr 40,000, of which annual depreciation is estimated to be Birr 5,000 assuming that its useful lifetime at eight years. Each member with a 0.25 ha plot is requested to pay Birr 250 a year (Birr 5,000/20 members). As seen in the above table, all the members except No. 3 and No.4 already generated more than Birr 250 a crop. From the results of the 1<sup>st</sup> PBME, the farmers' capacity to pay the pump replacement cost is basically proved. The monitoring will be continued by the OIDA Meki office.

## **5.8 Lessons Learnt**

### **5.8.1 Major Factors Governing Project Sustainability**

On the basis of the experiences obtained through the Meki study, Program II of the Study has made further attempts for standardization of the procedure for establishment of WUAs. The following are the lessons learnt through the Study.

- 1) Even Distribution of Land and Water Resources
- 2) Demarcation of Responsibilities between OIDA and WUA
- 3) Awareness Creation of Project Ownership
- 4) Optimum Irrigation Planning and Design
- 5) Integrated Agricultural Supporting System
- 6) Institutional Set-up

### **5.8.2 Even Distribution of Land and Water Resources**

The Oromia Regional Proclamation no. 56/1994 restricts the land holding of each WUA member to less than 0.5 ha per household (HH) under irrigation projects implemented by public organs. Through the Study, the JICA Study Team received many requests from members to allocate farmland sized at the maximum level, i.e. 0.5 ha per HH. However, the JICA Study Team advised the WUA members to start the projects with land limited to 0.25 ha per HH referring to the three main advantages, namely (i) maximization of the number of members for WUA; (ii) equitable distribution of farm plots for irrigation; and (iii) optimum performance and efficiency of irrigation farming by using a small pump of around 10 hp, of which O&M is suited to local conditions of the Meki area and the technical knowledge of the WUA members.

In order to reduce the project cost for canal construction (length of pipe line), it is recommended to arrange farm plots near to the proposed pump house. This condition often results in the necessity of land reallocation among the WUA members. To avoid future confusion including violation of agreements in land allocation among the WUA members, the Study learned that the land exchange

agreement should be prepared in written form witnessed by PA chairperson. As important measures, the Study recommends to prepare project

Apart from land resources, the even distribution of water resources is another important issue. A significant gap was identified between upstream and downstream areas in terms of fuel consumption for irrigation water conveyance in the Shubi and Sombo schemes. It seemed that the unity of the WUA members was highly subject to fair settlement of this crucial issue. The Study made intensive field observations of the conveyance loss in the existing canal systems and recommended the introduction of pipelines instead of earth canals for new schemes under Program II. This is an example of even distribution of water resources ensured by technical modification of facility plans.

#### 5.8.3 Demarcation of Responsibilities between OIDA and WUA

Project sustainability is susceptible to demarcation of responsibilities between OIDA and WUAs, who are the main stakeholders in community-based irrigation development. The roles and responsibilities of OIDA and WUA have to be clearly defined, especially for (i) financial arrangements for project implementation and (ii) construction and O&M of the project facilities.

Since 1999 when OIDA was established, the irrigation development has been under OIDA's responsibility, even through a participatory approach to plan formulation and construction is a basic concept of the current irrigation policy. After handing over of project facilities, in principle, the responsibilities for their O&M, including financial arrangements are fully under the WUA members. However, this is hardly functional due to lack of clear demarcation of responsibilities between both stakeholders. This is one of the reasons why international agencies, donors and NGOs have introduced different conditions for cost sharing of initial investment, procurement of farm inputs and rehabilitation of the relevant development schemes. Program II of the Study therefore set up clear demarcation of responsibilities as a premise for project implementation.

#### 5.8.4 Awareness Creation of Project Ownership

Project ownership is an essential factor for sustainable project management. Program II envisaged enhancing the sense of project ownership among the WUA members by allocating major responsibilities for water source development to them. Apart from the irrigation schemes along the Meki river, Program II selected the candidate WUAs on the lakeshore of Ziway and the groundwater irrigation areas around Alem Tena. The WUA members are obliged to make water sources available on site. This means that the WUA members dig either lead canals from

the Ziway lake to the site or shallow wells on site. All the responsibility for maintenance of water sources is currently under WUA. In drought years, therefore, the WUA members will take action for deepening and extending lead canals to the Ziway lake or digging shallow wells deeper until the lowered groundwater table is reached.

This condition will contribute, not only to strengthening project ownership of the WUA members, but also reduce the financial loads of OIDA. After the financial assistance of JICA phases out, the financial status of the project will not allow OIDA to extend further financial assistance to WUAs established under Program II. It is also crucial to optimize the financial responsibilities between OIDA and WUA so as to assure the project sustainability.

#### 5.8.5 Optimum Irrigation Planning and Design

As mentioned in Section 5.8.2 on Even Distribution of Land and Water Resources, the irrigation facilities should be planned and designed to guarantee the fair distribution of water resources among the WUA members. The technical specifications of facilities, in particular for participatory development, have to be optimized from the viewpoints of not only project economy but also social factors.

In the case of the Oda Chisa WUA, as aforementioned, the canal system was changed from open earth canals to a pipeline taking several advantages into consideration. During the construction, those advantages, as well as disadvantages were recognized. Flexibility in design changes is one of essential factors for optimum irrigation planning and design. It is more ensured in the participatory irrigation development.

#### 5.8.6 Integrated Agricultural Supporting System

Since the project was initiated and implemented by OIDA, the WUA members have been able to obtain government support for irrigation engineering, as well as appropriate assistance in agronomic extension and farm credits, which are also important for the WUA members. The integration of agricultural support services will be realized by close coordination between OIDA, Oromia Agricultural Development Bureau (OADB) and Oromia Corporative Promotion Bureau (OCPB). In addition to the governmental support, the Cooperative Union in Meki is another possible organ, which can supply the agricultural supports including credit services and marketing. Currently, some 12 WUAs comprising 500 members are under the one umbrella of the Cooperative Union in Meki. Further study is required.



### 5.8.7 Institutional Set-up

Under the decentralization policy, community-based irrigation development will be, in principle, a mandate of OIDA at the wareda level. However, the procedure from project application/selection to financial arrangement is not standardized. An institutional set-up for community-based irrigation development is urgently required. Besides, the capacity building of the wareda staff is also essential in parallel to institutional set-up. In light of this view, Program II of the Study verifies project development procedures in a form of the guideline for establishment and management of WUA for standardization.

## 5.9 Guidelines for Establishment and Management of Water Users Associations (WUA)

### (1) Purpose

The guidelines were prepared at the end of the Meki study in February 2001. Under Program II, an overall review was made and revised in order to meet the present requirement for the guideline.

### (2) Applicability of the guidelines

The guidelines are applied for community-based small-scale pump irrigation projects at the wareda level. There are two standard sizes of irrigation schemes depending on water source as follows.

**Applicability of Guideline**

Water Resource	Command Area	Beneficiaries	Plot Size	Pump Capacities
River or Lake	5 ha	20 HH	0.25 ha/HH	10 HP
Groundwater (Shallow Well)	3 ha	12 HH	0.25 ha/HH	5 HP

### (3) Users of the guidelines

Users of the guidelines are social workers and engineers of OIDA engaged in community mobilization of irrigation development projects. The guideline was translated into the Oromo Version and distributed to 197 waredas of the region.

### (4) Concept of the Project

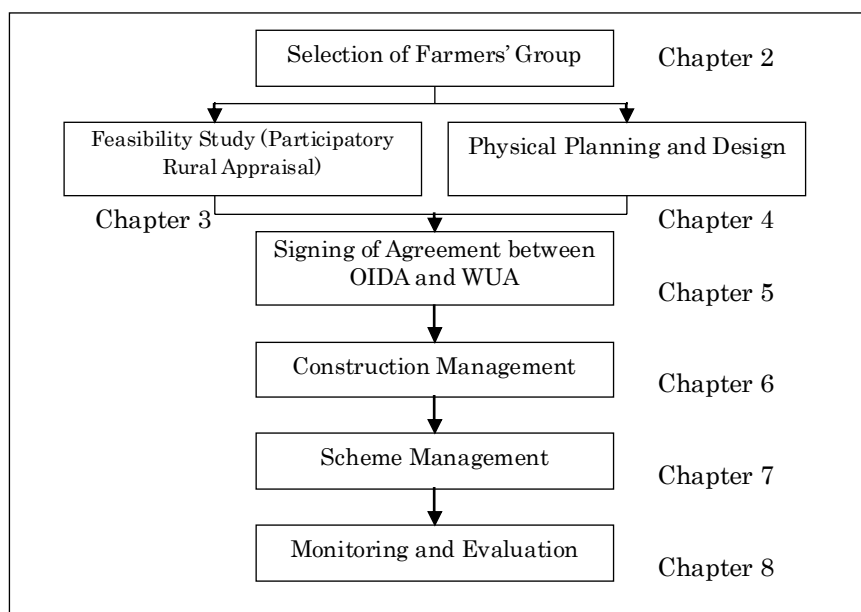
The guidelines indicate the process in line with the following concepts, learning from past experience:

- 1) Concepts to achieve sustainable irrigation development, focusing on the following aspects.

- Fair distribution of land and water resources among farmers
  - Fund formation by farmers
  - Saving for replacement of pumps
- 2) Awareness creation to let farmers understand the above concepts and the difficulties of irrigated farming practice
  - 3) Discussion of the responsibilities of OIDA and WUA, and consequent signing of an agreement with the farmers.
  - 4) Enhanced farmers' participatory approach in planning and construction period
  - 5) Strengthening WUA support for scheme management
  - 6) Strengthening the monitoring and evaluation systems by OIDA and WUA

(5) Contents of Guidelines

The guidelines are set up according to the workflow of the WUA establishment in order. The contents of the guidelines are presented below.



**Contents of the Guidelines**

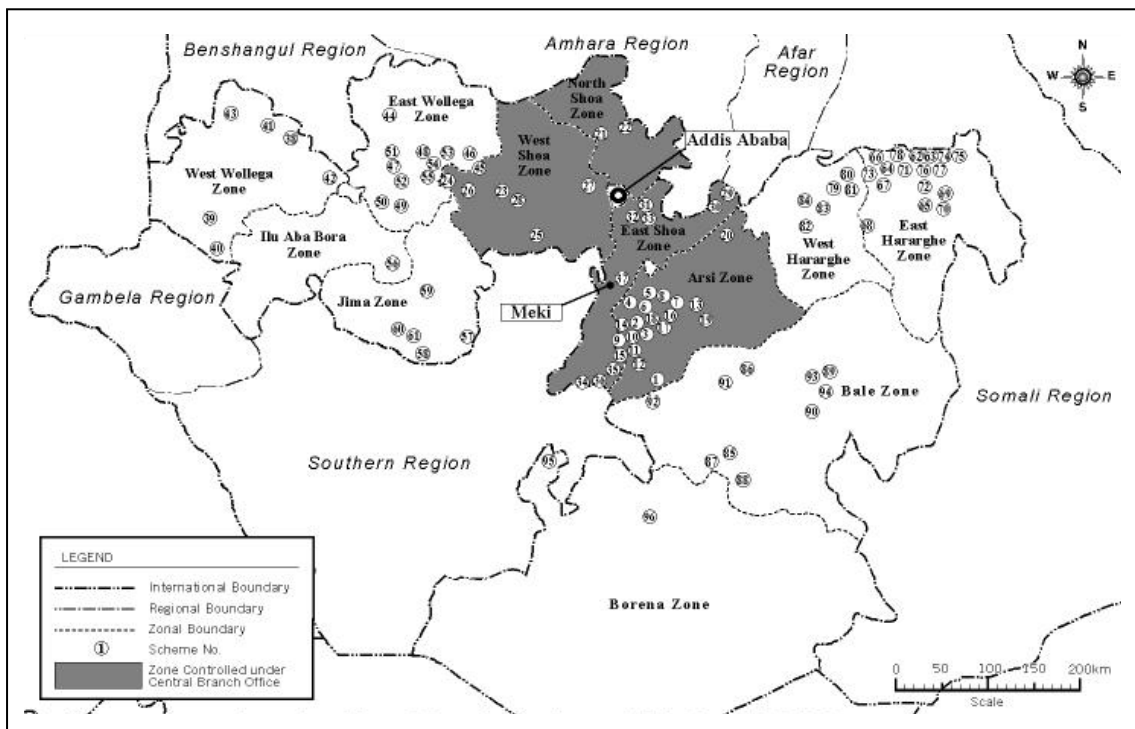
## CHAPTER 6

### REHABILITATION OF EXISTING SCHEMES (PROGRAM III)

#### 6.1 Objectives

OIDA takes the major responsibility for provision of government services to 132 existing irrigation schemes in the Region. Out of 132 schemes, 96 schemes were inspected through the verification study of the Meki study in 2001. The overall irrigation performance of 96 schemes was as low as 58% (actually irrigated area/planned scheme area). The enhancement of irrigation performance of the existing schemes is a key issue for OIDA.

Program III aimed at standardization of the development methodology of rehabilitation works and capacity building of the OIDA staff by taking three model schemes from among the 37 schemes within the service area of the Central Branch Office of OIDA indicated as the shaded part of the location map below.



Location Map of Existing OIDA Schemes

Source : Meki Irrigation and Rural Development Project (JICA, 2002)

#### 6.2 Model Rehabilitation Works

##### 6.2.1 Selection Criteria

Program III selected three model schemes from among the 37 existing irrigation

schemes under OIDA Central Branch Office according to the selection criteria mentioned below.

- 1) Selected schemes face common technical problems prevailing among the OIDA schemes.
- 2) Selected schemes are located within an area of good accessibility to ensure study efficiency and high demonstration effects.
- 3) Selected schemes require small-scale but urgent rehabilitation.
- 4) Cost performance of rehabilitation is high.

#### 6.2.2 Selection of Schemes

First of all, attempts were made to classify the existing schemes into the following three categories on the basis of the causes of low irrigation performance.

Category A: Low irrigation performance is caused directly by serious defects and deterioration of irrigation facilities. On the basis of engineering information, PRA will be held to confirm the rehabilitation plan with the WUA. The priority works will be selected through detailed engineering study. PRA will focus on participation of the WUA in rehabilitation works and cost sharing. Repair of canal leakage and clearing will be prioritized.

Category B: Irrigation activities are stagnant due to weak WUA management resulting in low irrigation performance. Awareness creation and problem analysis will be intensively done among the WUA so as to verify the prevailing causes of low irrigation performance. Necessary measures will be taken to eliminate constraints within the community and for strengthening WUA capacity.

Category C: Causes of low irrigation performance vary by scheme. Instead of taking quick action for rehabilitation purposes, major cause-effect relationships prevailing in a scheme will be identified through monitoring and evaluation. Unfair distribution of land and water resources often causes conflicts among WUA members resulting in weak WUA management. Low incentives for O&M among WUA members accelerate deterioration of irrigation facilities. In addition to complex constraints of Categories A and B, external factors often have an adverse affect. For instance, change in marketing circumstances often directly hinders smooth operation of an irrigation project. Both water and land use change in the area upstream of the water source of a project will also affect project performance.

On the basis the data and information collected through the Meki study, each of the 37 schemes was classified into one of three categories or categorized as functioning at a reasonable level as presented in Table 6.2.1 and summarized below.

### Problem Category and Number of Schemes

Symbol	Category	Nos. of Scheme
A	Deterioration of facilities	5
B	Weak WUA management	7
C	A+B or other constraints	15
Functioning at reasonable level		10
Total		37

#### 6.2.3 Selected Model Schemes

Program III selected three model schemes, namely Ketar, Gedamso and Sadi Sadi, & Lafa, one from each of the three categories on the basis of the field inspection results and the discussions between the JICA Study Team and the OIDA counterpart team.

The Ketar scheme (Category A) was characterized by deterioration of main facilities, i.e. main canals 20 years old that needed urgent rehabilitation. The WUA management is reasonably steady so as to maintain the facilities with minimum support from OIDA. The Gedamso scheme (Category B) was initiated under the resettlement program of pastoral communities. Although the facilities are still functional, the WUA management is too weak to operate and maintain them. The Sadi Sadi & Lafa schemes (Category C) are located in areas remote from the local market center. The deteriorated rural infrastructure, especially roads to the market, was a major constraint against proper agricultural activities. The command areas and number of beneficiaries of the selected schemes before rehabilitation are summarized below.

#### Command Areas and Beneficiaries of the Selected Schemes

No.	Scheme	Wareda	Command Area (ha)		Beneficiaries(HH)	
			Plan	Actual	Plan	Actual
1.	Ketar	Tiyo	400	367	590	642
2.	Gedamso	Munnesa	170	100	134	156
3.	Sadi Sadi & Lafa	Munnesa	140	88	350	380
	Total		710	555	1,074	1,178

Source: Benchmark survey in August 2003

#### 6.2.4 Procedure of Rehabilitation Works

Under the direct control of the General Manager and the Central Branch Manager, OIDA organized the study team consisting of two engineers, one agronomist and one surveyor for intensive site inspection for preparation of a proposal for rehabilitation plan of the three schemes.

The rehabilitation work under Program III was started in June 2003 and completed in March 2004 according to the following steps.

#### **Procedure of Program III**

Step 1	Selection of model schemes
Step 2	Inventory survey of existing irrigation facilities
Step 3	Baseline survey of WUA
Step 4	Initial Environmental Examination (IEE)
Step 5	Formulation of rehabilitation plan and detail design
Step 6	Preparation of rehabilitation schedule
Step 7	Procurement and rehabilitation works
Step 8	Preparation of plot map and plot list
Step 9	Handing-over of irrigation facilities
Step 10	Training for DA and WUA for O&M of irrigation facilities

#### **6.2.5 Design Standards for Rehabilitation Works**

The Ministry of Water Resources of the Federal Democratic Republic of Ethiopia prepared the following guidelines in 2002.

- 1) Guideline, Manuals & Standard Design of Small & Medium Scale Irrigation Projects
- 2) Procedural Guidelines for Study of Small & Medium Scale Irrigation Projects in Ethiopia

The planning and design works for rehabilitation under this study shall comply with the above guidelines.

### **6.3 Initial Environmental Examination (IEE)**

#### **6.3.1 Scope and Objectives of the Study**

The IEE is a requirement of the Environmental Policy of the FDRE based on the Environmental Impact Assessment Guideline Document, July 2000 of the Environmental Protection Authority (EPA) of the FDRE. The IEE has two components: screening and scoping. Screening is a preliminary environmental review to assess whether an EIA is necessary or not for a proposed development project. And if needed, to decide the nature and magnitude of the proposed project's potential environmental and social impacts and assigns the project to one of the three categories (schedules) according to the EIA Guidelines of the FDRE.

Once a project is categorized, a scoping process defines the project's likely environmental impacts and the area of influence more precisely and develops terms of reference (TOR) for the EIA. As part of this process, information about the project is disseminated to local communities and NGOs, followed by consultations to help to focus the EIA on issues of concern at the local level.

### 6.3.2 Guidelines for IEE

The IEE for irrigation projects under OIDA has been conducted according to checklists prepared by either donors or executing agencies of relevant projects. For OIDA, the Study and Design Department is responsible for IEE and officially applies to the following two guidelines;

- 1) ESRDF's Small Scale Irrigation Project (Gravity) Technical Handbook, Component I on Guideline onSSIP Project Formulation (Nov. 1997), and
- 2) Study of Small & Medium Scale Irrigation Projects in Ethiopia, Part H Study Guideline on Environmental Impact Assessment, Ministry of Water Resources of FDRE (Aug. 2002).

### 6.3.3 Results and Recommendations

According to the check lists proposed by the above-mentioned guidelines, the IEE was conducted to assess potential impacts of rehabilitation works for the three selected schemes, namely Ketar, Gedamso and Sadi Sadi & Lafa schemes. The results are presented in Annex VI on Rehabilitation of Existing Schemes (Program III) and summarized below.

#### 1) Conflicts with water supply rights

The diversion discharges from the relevant rivers are already fixed and will not be reduced by implementation of rehabilitation works. It will not lead to any competition or conflicts among water users in downstream areas.

#### 2) Social impacts

Land ownership is currently subject to the recent proclamation by the Oromia Regional State Government on the maximum land holding size at 0.5 ha/HH in an irrigation project area. Large land holders of over 0.5 ha in the Gedamso scheme will be advised to re-allocate parts of their lands to the peasants and the landless farmers. This will bring significant social impacts to the WUA members of the scheme. It is recommended to monitor the progress and impacts through PBME.

### 3) Change of river flow regime

The rehabilitation works will not cause a change of current flow regime in the relevant rivers. Although there is no government policy on maintenance flow requirements in the rivers or minimum water levels in lakes at present, a guideline should be set up in the future to ensure equitable apportionment of water resources. The Study recommends continuing hydrological review for all the existing schemes to optimize the diversion discharge.

### 4) Water quality change

Water quality deterioration is expected through additional pollution loads from the irrigation area. This would contain chemical fertilizers, insecticides and herbicides with deleterious effects on human and animal health. The possibility and magnitude of these impacts should be clarified based on the data related to river flow discharge and water quality analysis in the future. Technical guidance to farmers will be required.

### 5) Impacts on ecosystems

The aquatic plants, phytoplankton, zooplankton, fish and waterfowl in the downstream water bodies will be disturbed if the water flow regime is changed. Environmental monitoring should be carefully continued to control water flow regime of the relevant rivers.

### 6) Positive impacts

Despite the above potential negative impacts of the proposed rehabilitation works, the overall effect on the people within the scheme area is expected to be positive. The environmental conservation component will ensure environmentally sustainable development. Afforestation and water conservation should be promoted in parallel with the rehabilitation works. They will ensure sustainability of the irrigation development by reducing soil erosion and sedimentation in the watershed as well as by improving the river flow regime and water supply. Also, the environmental monitoring and management plan to be developed in the EIA is expected to effectively mitigate the negative environmental and social impacts of the proposed irrigation development. Overall, Program III is expected to improve the livelihood of the target group through increased food production and availability of water for crop production, human and livestock use.

It is assessed that potential environmental impacts of the proposed rehabilitation works under Program III are low or negligible. Therefore, the Study will not request OIDA to proceed to a full Environmental Impact Assessment (EIA). However, it is recommendable for OIDA to continue the environmental monitoring



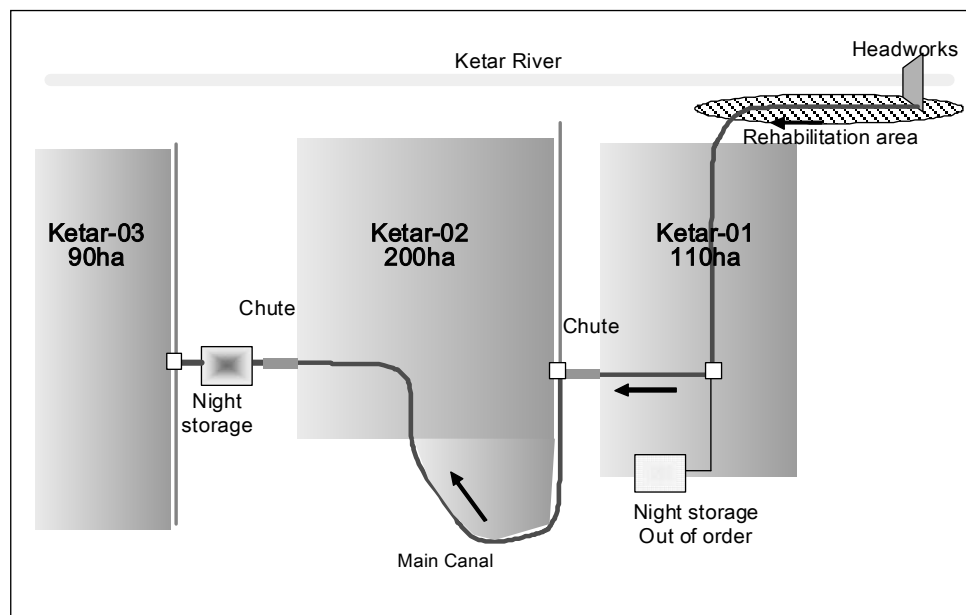
as a part of regular PBME.

## 6.4 Performance of Rehabilitation Works

### 6.4.1 Ketar Irrigation Scheme

#### (1) Overview of irrigation scheme

Ketar irrigation scheme is located in Tiyo wareda of Arsi zone. The scheme is located 23 km south of Asela or 105km south of Adama. This scheme consists of three sub-schemes, which are called Ketar-01 (Ketar Genet), Ketar-02 (Golja) and Ketar-03 (Hamsa Gasha) with a total irrigation area of 400 ha. The lifeline of this scheme is the main canal, which serves irrigation water to all three sub-schemes.



**Layout of Ketar Scheme**

#### (2) General conditions of irrigation facilities before rehabilitation

The Ketar river is one of the biggest rivers in Arsi zone. The river drains into the Ziway lake with a large amount of water collected from the 3,460 km<sup>2</sup> catchment area, including the highlands of Meraro and part of the Chilalo mountain area. The design discharge for the scheme is about 860 lit/sec to irrigate about 400 ha according to a previous design report. This design discharge includes domestic demand and consumption by animals. There is a night storage facility just at the outlet of Ketar Genet along the main canal, which is used to supply domestic water to Golja town through a pipe system.

The total length of the main canal system is 12 km, of which the first 5 km is a headrace from the intake to the beginning point of Ketar-01. The main canal was constructed with lining treatment of wet masonry work in the 1980s. After

continuous use for last two decades, the main canal is seriously deteriorated with many cracks in the mortar joints. The deterioration process was accelerated by the steep topographic conditions. Since the main canal passes through the middle of the steep slope of the Ketar river valley, soils retaining the canals, especially behind their right embankment, (valley side) are seriously eroded. As a result of lack of retaining materials, canals suffer from elongated horizontal cracks from place to place. Only 460 lit/sec flows at the beginning point of Ketar-01 area against the design discharge of 860 lit/sec.

The related facilities, including two large chutes between Ketar-01 and 02, as well as 02 and 03, the night storage, secondary and tertiary canals are all functional. On-farm facilities, including division boxes, drop structures, etc. are operational according to the site inspection. Irrigated farmland is fully utilized for potatoes, onion, sugar beets, maize, teff, etc.

### (3) WUA management

The number of WUA members is summarized as below.

**Number of WUA members**

Scheme	WUA	Number of Members	Year of Establishment
Ketar - 01	Ketar Genet	277	1999
Ketar - 02	Golja	190	1999
Ketar - 03	Hamsagasha	175	1999
Total		642	

Source: WUA baseline survey, JICA Study Team, September 2003

Hamsa Gasha WUA was already fully organized and had a legal certificate, while the organizational set-up of both Ketar Genet and Golja WUAs is still in progress under a cooperative association. The Ketar scheme is under the management of one common board executive committee and all of the three sub-schemes have their own executive committees and block leaders. In addition, two WUAs of Ketar Genet and Hamsa Gasha have inspection committees.

The WUA members frequently carry out the minor maintenance and repair works of the main canals by themselves. Through the site inspection, repair works done by the WUA members were observed at several sections of the main canal. In order to reduce seepage, the members have tried to refill mortar along horizontal cracks formed inside the canal. The catch-drains were also constructed on the hillside in parallel with the main canal in order to reduce surface run-off damaging the main canal.

(4) Required rehabilitation activities

In spite of great efforts of maintenance and repair works by WUA members, there were still many cracks and deterioration points in the main canal up to the pond inlet. Since this scheme was constructed around 20 years ago, the degree of deterioration of main canals was beyond the capacity of the WUA. In order to secure the sustainability of the entire project, major rehabilitation works of the main canal were required urgently. Findings in existing facilities and required rehabilitation works are shown in the Table 6.4.1.

(5) Activities from May 2003 to December 2003

The records of rehabilitation work for the Ketar scheme are summarized below.

11 Jun. 2003	: Preliminary site inspection
26 Jun. 2003	: Site selection meeting with OIDA
2 to 16 Aug. 2003	: Inventory survey of existing irrigation facilities
9 Aug. 2003	: Baseline survey of WUA
17 Aug. to 15 Sep.2003	: Formulation of rehabilitation plan, detailed design, and cost estimate
16 Sep. 2003	: Meeting on rehabilitation works with OIDA
26, 27 Sep. 2003	: Preparation of rehabilitation schedule
4 Oct. 2003	: Commencement of rehabilitation works
8 Nov. 2003	: Preparation of plot map and plot list
10 Dec. 2003	: Completion of rehabilitation works
11 Dec. 2003	: Final inspection and handing-over

(6) Rehabilitation works

The physical rehabilitation works for the Ketar scheme are summarized below:

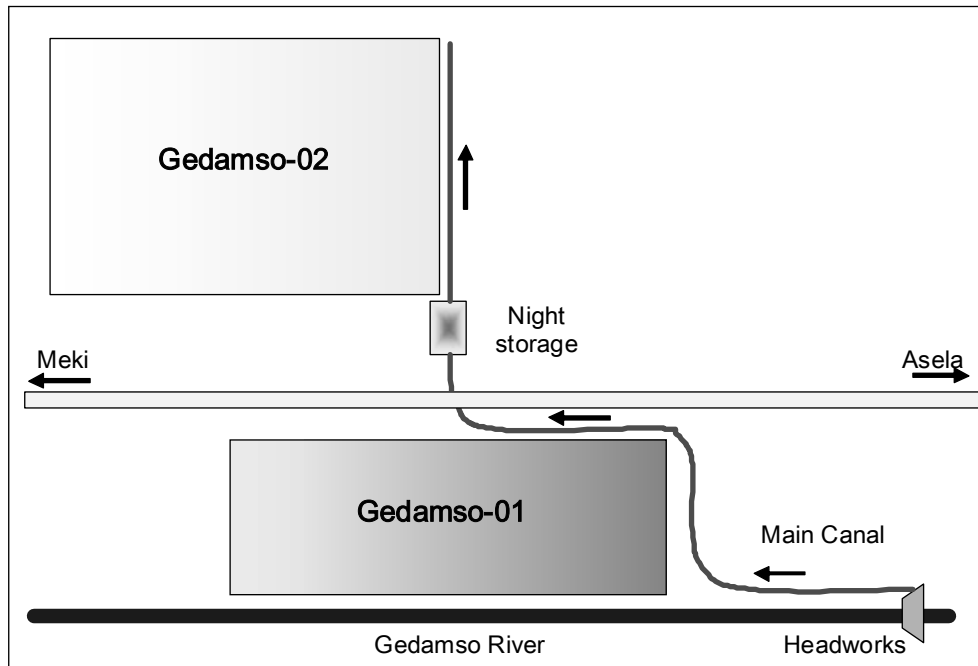
**Rehabilitation Works in Ketar Scheme**

Irrigation Facilities	Rehabilitation Works
1. Main canal	
1.1 Aqueduct (sheet metal)	- Provision of anti rust : 220m
1.2 Lined canal	- Re-plastering of lining : 4,600m
	- Construction of retaining wall : 20m
	- Provision of gabion : 124m <sup>3</sup>
1.3 Earth canal	- Excavation and cleaning : 5,500m
2. Canal structures	
2.1 Culvert	- Construction of culverts : 3 nos.
2.2 Spillway	- Replacement of gates : 2 nos.
2.3 Division box	- Provision of gates : 4 nos.
2.4 Chute	- Re-plastering of lining : 150 m

## 6.4.2 Gedamso Irrigation Scheme

### (1) Overview of irrigation scheme

Gedamso scheme is located in Buku Waldya PA, Munessa wareda of Arsi zone about 90 km south of Meki town and at a distance of 180km from Adama through Assela. This scheme consists of two sub-schemes, Gedamso-01 and Gedamso-02, with one headwork on the Gedamso river flowing into the Langano lake. The general layout of the scheme is illustrated below.



**Layout of Gedamso Scheme**

### (2) General conditions of irrigation facilities

The water source is the Gedamso river. The design discharge of the main canal is 185 lit/sec to irrigate 170 ha. During the site inspection, no serious problems of the main facilities, i.e. headworks or main canal, were observed. However, some symptoms were identified implying weakness of the WUA. They are;

- 1) Much siltation inside canals i.e. main, secondary, tertiary, and quaternary canals
- 2) Heavy weed infestation and erosion of slope inside canals
- 3) Damaged fence around the night storage and division boxes left for long period
- 4) No stop-logs at the division boxes

### (3) WUA management

The scheme was started under the resettlement program of pastoral communities. Since the communities were not sufficiently involved in the planning process of this scheme, beneficiaries are not well aware of their status as owners of the scheme and were too vulnerable to confront the development activities in association with the

government agencies. The WUA consists of 156 HHs. Both Gedamso-01 and Gedamso-02 have independent WUAs. The WUAs were organized in 1997. However, they dissolved their committee members in 2001 and amalgamated to one WUA. Only 20 HHs are in the leading position of the scheme. All the executive committee members are elected from those 20 HHs.

Canal clearing and cash contribution are expected from all 156 WUA members when the necessity arises. Non-cooperative members have no interest to contribute their money to WUA. There is a feeling of minority domination over the majority, and some conflicts have been created between them.

Farming practices were not well developed since the members were semi-pastoralists in the past. However, they have been shifting their livelihood style to sedentary agriculture recently. There is also unequal allocation and distribution of irrigation land among the WUA members that widely range from 0.13 ha. to 4.0 ha. Only 70 ha or 50% of irrigation land has been developed, while rain fed farming is practiced within the scheme. Limited farm family labor is also a constraint. Since the unity of the WUA is adversely affected by such unfavorable landholding conditions, the members are too demoralized to maintain their scheme facilities with any sense of ownership. Lack of operational rules accelerates deterioration of the facilities.

#### (4) Required rehabilitation works

The Gedamso is a modern irrigation scheme with various components required for gravity irrigation and drainage system. Its components are listed below;

**Existing Facilities of Gedamso Scheme**

No.	Irrigation Facilities	Related Facilities
1.	Head work	Weir body, Wing walls, Flood protection wing wall, Intake gate, and Sluice gate
2.	Conveyance and Distribution canals	Main, Secondary, Tertiary and Quaternary canal and Silt trap basin
3.	Field structures	Culverts, Division Boxes, Drops, Offtakes (Turnouts)
4.	Night Storage	Pond body, Inlet Structure, Outlet Gate and Spillway
5.	Drainage ditches	Field, Tertiary, Secondary, Main drains and Escape structure
6.	Farm roads	

The major irrigation components, which required due attention in the project operation and maintenance, were selected as presented in the Table 6.4.2.

#### (5) Activities from May 2003 to February 2004

The records of rehabilitation work for the Gedamso scheme are summarized below.

11 Jun. 2003	: Preliminary site inspection
26 Jun. 2003	: Site selection meeting with OIDA
2 to 16 Aug. 2003	: Inventory survey of existing irrigation facilities
6 Aug. 2003	: OIDA and WUA joint meeting, awareness creation
6 Aug. 2003	: Baseline survey of WUA
17 Aug. to 15 Sep.	: Formulation of rehabilitation plan, detailed design, and cost estimate
16 Sep. 2003	: Meeting on rehabilitation works with OIDA
26, 27 Sep. 2003	: Preparation of rehabilitation schedule
1 Oct. 2003	: OIDA and WUA joint meeting, plan of rehabilitation works
4 Oct. 2003	: Commencement of rehabilitation works
8 Nov. 2003	: Preparation of plot map and plot list
23 Nov. 2003	: Re-election of WUA executive committee
14 Nov. 2003	: Commencement of land exchange
11 Jan. 2004	: Completion of rehabilitation works
6 Jul. 2004	: Handing over

The rehabilitation was started by in-depth discussions for awareness creation of ownership of the scheme. Lengthy conflicts among the community were also identified, i.e. upstream (01) vs. downstream (02), cooperative members vs. non-cooperative members, land owners and landless, etc. To strengthen the unity of the community, the JICA Study Team and the OIDA counterparts suggested that they embark on physical rehabilitation of the scheme facilities with their full involvement, which will give them a great opportunity to take off from this dead-end.

The JICA Study Team also suggested OIDA DAs to spearhead rectification of prevailing constraints among the community. This was started with preparation of plot layout maps in parallel with physical rehabilitation works. The maps were expected to help the community to identify the extent of the scheme area and beneficiaries of the scheme. The WUA embarked on confirmation of beneficiaries and land re-allocation on the basis of the map thus prepared. The land exchange from large landowners to peasants and landless farmers is still going on.

#### (6) Rehabilitation works

Apart from community mobilization, the rehabilitation works were implemented in terms of the following facilities by participatory works. The physical rehabilitation works for the Gedamso scheme are summarized below:

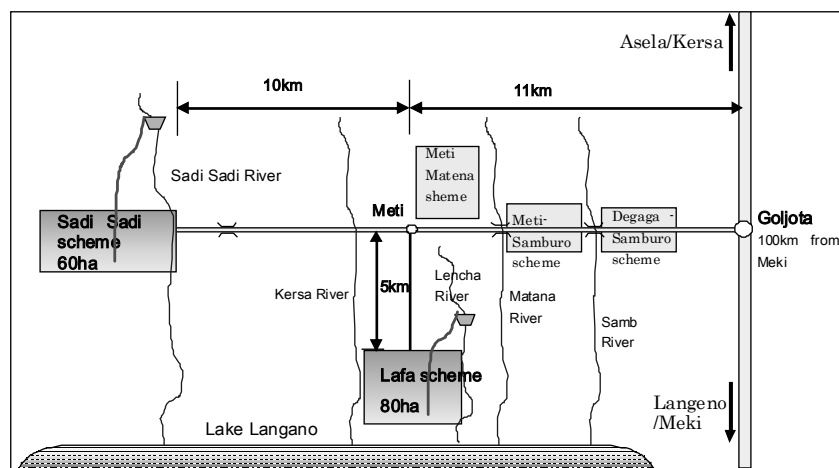
### Rehabilitation Works in Gedamso Scheme

Irrigation Facilities	Rehabilitation Works
1. Headworks	- Replacement of sluice gate : 1 no
2. Canals	
2.1 Main canal	- Excavation of earth canal : 3,700m - Provision of canal base indicators - Construction of lining : 20m
2.2 Secondary canals	- Excavation of earth canal : 2,800m - Provision of canal base indicators
2.3 Tertiary and quaternary canals	- Excavation of earth canal : 12.2 m - Construction of lining at TC4-4 : 40 m - Provision of canal base indicators
3. Canal structures	
3.1 Division boxes	- Modification of gates : 2 pcs - Provision of new gates : 2 pcs.
3.2 Off-takes	- Construction of additional offtakes : 4 pcs.. - Provision of gates : 168 pcs
3.3 Drop	- Re-plastering of structures
3.4 Culvert	- Construction of culverts : 2 nos.
4. Night storage	- Replacement of outlet gate : 1 pcs.
5. Canal slope protection works	- Provision of gabion : 44.0 m <sup>3</sup>

#### 6.4.3 Sadi Sadi & Lafa Irrigation Schemes

##### (1) Overview of irrigation schemes

The rural road network within Arsi zone is relatively good as a result of enormous investment made under the Arsi-Bale Rural Development Project. There is a road 6 m wide paved with local materials (red ash) between Langano and Kersa passing in parallel to the southern fringe of the Langano lake in an EW direction. Along this road, OIDA has developed several irrigation schemes by utilizing small streams flowing into the Langano lake, namely Gedamso, Argata and Shoba. This road is branched at Goljota town, which is located 115 km south west of Asela. Along this branch road, there are five small-scale irrigation schemes of less than 100 ha/scheme including both Sadi Sadi and Lafa irrigation schemes as illustrated below.



**Location of Sadi Sadi and Lafa Schemes**

## (2) General conditions of irrigation facilities

Sadi Sadi and Lafa irrigation schemes are irrigation projects conducted by Arsi WMERDO in 1995 and completed in 1997. Their main water sources are the Sadi Sadi and Lencha rivers, respectively.

Sadi Sadi scheme was initially started by traditional irrigation farming. The project planned to irrigate 60 ha of which only 41 ha are currently irrigated and the rest is occupied by homestead. Due to disordered fencing and expansion of farm plots, the canal network is not efficiently aligned. The headwork of Sadi Sadi scheme is situated in the hilly land to divert 80 lit/sec from the Sadi Sadi river. The river discharge is supplemented by quite a substantial amount of spring water flowing into the river. The main canal of 350 m long passes through a vertical cliff and big boulders.

The intake weir of the Lafa scheme was constructed on the Lencha river with diversion discharge of 120 lit/sec in order to irrigate 80 ha for 140 HH, but only 53 ha of land has been irrigated. The canals are of stone masonry and the main and secondary canals, except for one secondary canal, were constructed across the contour. Maintenance has not been conducted since the project completion.

Poor road conditions are the main constraints against project operation for both schemes. According to the farmers, sugarcane and maize are currently the main crops of the schemes because bad roads do not allow them to produce horticultural crops that bruise easily. Due to remoteness and poor road conditions, any government support to these schemes is too limited. OIDA has a strong intention to extend their support to road repairing.

## (3) WUA management

The number of WUA members in each scheme is summarized below.

**Number of WUA members**

WUA	Number of Members	Year of Establishment
Sadi Sadi	240	1997
Lafa	140	1997
Total	380	

Source: WUA baseline survey, JICA Study Team, September 2003

The WUA of the Sadi Sadi scheme has one executive committee, which consists of five members and 12 block leaders. Their management and financial capacity seems weak. They have no any permanent contribution for the O&M activities of the scheme. However they have a good and strictly respected water distribution program for the members. Block leaders have played a great role in the water



distribution program.

The WUA of the Lafa scheme has one executive committee, which consists of four members with about 11 block leaders under them and three members of the inspection committee. The committee is incomplete and weak. They have no permanent financial contribution for O&M activities and do not even have a fixed meeting schedule.

#### (4) Required rehabilitation activities

The components of Sadi Sadi and Lafa schemes are listed below:

##### Existing Facilities of Sadi Sadi Scheme

No.	Irrigation Facilities	Related Facilities
1.	Head work	Weir body, Wing walls, Flood protection apron, Intake gate, and Sluice gate
2.	Conveyance and Distribution canals	Main and Secondary canals
3.	Field structures	Culverts, Division Boxes, Drops, Offtakes (Turnouts)
4.	Farm roads	Inspection road

##### Existing Facilities of Lafa Scheme

No.	Irrigation Facilities	Related Facilities
1.	Head work	Weir body, Wing walls, Flood protection apron, Intake gate, and Sluice gate
2.	Conveyance and Distribution canals	Main, Secondary and tertiary canals
3.	Field structures	Culverts, Division Boxes, Drops, Offtakes (Turnouts), and Energy dissipaters
4.	Farm roads	Inspection road

Major irrigation components, which require due attention in the project operation and maintenance, are discussed in the Table 6.4.3.

#### (5) Activities from May 2003 to February 2004

The records of rehabilitation work for the Sadi Sadi and Lafa schemes are summarized below.

- 21 Jun. 2003 : Preliminary site inspection
- 26 Jun. 2003 : Site selection meeting with OIDA
- 2 to 16 Aug. 2003 : Inventory survey of existing irrigation facilities
- 7 Aug. 2003 : Baseline survey of Sadi Sadi WUA
- 8 Aug. 2003 : Baseline survey of Lafa WUA
- 26 Aug. to 7 Sep. : Level survey of access road
- 17 Aug. to 15 Sep. : Formulation of rehabilitation plan, detailed design, and cost estimate
- 16 Sep. 2003 : Meeting on rehabilitation works with OIDA
- 26, 27 Sep. 2003 : Preparation of rehabilitation schedule

- 14, 15 Oct. 2003 : Meeting on the issues of access road maintenance with WUAs, communities, PAs, and warda administration staff
- 22 Oct. 2003 : Commencement of road maintenance works by the communities
- 11 Dec. 2003 : Commencement of rehabilitation works in Lafa and the access road by OIDA
- 1 Feb. 2004 : Completion of rehabilitation works in Lafa
- 9 Feb. 2004 : Commencement of rehabilitation works in Sadi Sadi
- 3 Mar. 2004 : Completion of rehabilitation works in Sadi Sadi
- 6 Jul. 2004 : Handing over of Sadi Sadi and Lafa Schemes

(6) Rehabilitation works

The physical rehabilitation works for the Sadi Sadi and Lafa schemes are summarized below:

**Rehabilitation Works in Sadi Sadi and Lafa Schemes**

Irrigation Facilities Rehabilitation Works	
1. Sadi Sadi Scheme	
1.1 Headworks	- Improvement of weir body : 1 no
	- Installation of intake and sluice gates
1.2 Canals	- Lining of main canal : 600 m
	- Plastering of secondary canals : 200 m
	- Lining of tertiary canals : 500 m
1.3 Canal structures	- Improvement of division box : 1 no
	- Installation of gates at offtakes : 24 pcs.
	- Construction of cross drainage : 1 no
2. Lafa Scheme	
2.1 Headworks	- Extension of right side wall : 1no
	- Maintenance of sluice gate : 1no
2.2 Canal	- Plastering of main canal : 130 m
	- Plastering of secondary canal : 2,500 m
2.3 Canal structures	- Improvement of division box : 2 no
	- Installation of gates at offtakes : 23 pcs.
	- Construction of culvert : 1 no
	- Construction of cross drainage : 1 no
3. Access Road between Goljota and Sadi Sadi / Lafa	
3.1 Road	- Road clearing work : 15.0 km
	- Filling gully erosion : 10.2 km

6.4.4 Cost Implication of Rehabilitation Works

All the rehabilitation works for the three schemes were completed in March 2004. Estimated costs and actual expenditures for the rehabilitation works for the three schemes are summarized below.

### Summary of Estimate Costs and Expenditures

No.	Scheme	Area (ha)	Estimated cost (Birr)	Cost	
				Total (Birr)	Unit (Birr/ha)
1.	Ketar	400	295,400	350,400	876
2.	Gedamso	170	106,000	160,700	945
3.	Sadi Sadi & Lafa	140	421,000	473,833	3,385
	Total/Average	710	822,400	984,933	1,387

Source: The JICA Study Team, May 2004

## 6.5 PBME of Rehabilitation Schemes

### 6.5.1 Methodology

Project Design Matrix (PDM) of Program III is presented in Table 6.5.1. The PBME was carried out to collect and analyze necessary information in terms of the verifiable indicators stipulated in the PDM. Interviews were held with WUA board members by OIDA DAs for the following aspects.

#### Monitoring Aspects to WUA Board Members

No	Index	Monitoring Aspects
1	Irrigation performance	Cultivated area
2	No. of WUA members	No. of WUA members and actual cultivating farmers
3	Basic information of WUA	Starting year, official hand-over
4	WUA organization	Profile of WUA board members, roles of board members
5	WUA meeting	Type of meeting and frequency, attendance of meeting, agenda, record keeping and minutes of meeting
6	Financial management	Collection of water charge, collection ratio, bank and cash account, revenue and expenditure
7	Water management	Water distribution rules, water disputes, solution of disputes
8	Land distribution	Land distribution, problems, countermeasure taken
9	O&M activities of WUA	Details of O&M, frequency of O&M activities, process of O&M work
10	Bylaws of WUA	Formulation of bylaws and their contents
11	Irrigation farming	Type of crops, process to select crops, production constraints
12	WUA Management	Problems on WUA management
13	Relation with the surrounding community	Some issues between WUA and surrounding community

The questionnaire survey was also carried out with some 5% of the total WUA members. The PBME was carried out according to the following workflow.

- 1) Interview with DAs and WUAs at three schemes : 24 May to 2 Jun. 2004
- 2) Questionnaire survey with WUA members : 24 May to 2 Jun. 2004
- 3) Supplemental survey : 4 to 5 Jun. 2004
- 4) Analyses and report preparation : 6 to 10 Jun. 2004

## 6.5.2 Respondents

The number of respondents to the interview and questionnaire is summarized below.

**The Number of Respondents**

Scheme	WUA	Interview with WUA board members	Questionnaire survey with WUA members
Ketar	Ketar Genet	7	10
	Golja	7	12
	Hamsa Gasha	7	18
Gedamso	Gedamso	7	5
Sadi Sadi & Lafa	Sadi Sadi	7	8
	Lafa	7	8
Total		42	61

Source : JICA Study Team, 2004

## 6.5.3 Major Findings through PBME

The following are the major findings through the PBME.

### (1) Expansion of irrigated area by improved facilities

The Ketar scheme was handed over to WUA in December 2003, while both Gedamso and Sadi Sadi & Lafa schemes were in June 2004. According to the interview with the WUA boards and members, water discharge was increased in all three schemes enabling them to supply irrigation water to more WUA members. As a result, water disputes among the WUA members are significantly mitigated. In both Gedamso and Sadi Sadi & Lafa schemes, steel gates were installed on some division boxes so as to control canal water discharge to meet the water distribution plans. The WUA committee members recognize that illicit water tapping was reduced.

The irrigation area and the WUA members were increased in most of the WUAs after rehabilitation as presented below.

**Summary of Rehabilitation Schemes**

Scheme	WUA	Plan		Before Rehabilitation (A)		After Rehabilitation (B)		Improvement Ratio (B/A)	
		Irrigation area (ha)	Member (HH)	Irrigable area (ha)	Member (HH)	Irrigable area (ha)	Member (HH)	Irrigable area	Member
Ketar	Ketar Genet	110	276	107	277	115	282	107%	102%
	Golja	200	180	170	190	198	202	116%	106%
	Hamsa Gasha	90	114	90	175	125	205	139%	117%
Gedamso	Gedamso	170	134	100	156	150	309	150%	198%
Sadi Sadi & Lafa	Sadi Sadi	60	210	35	240	50	240	143%	100%
	Lafa	80	50	53	140	70	145	132%	104%
Total		710	964	555	1,178	708	1,383	128%	117%

Remark: Planted Area after rehabilitation of both Gedamso and Sadi Sadi & Lafa schemes were estimated by current water volume. Because, Irrigation water was not available through main canals during the rehabilitation period, some beneficiary farmers were faced to give up dry season crop started in and after October 2003.

Source: PBME results, June 2004

## (2) Improvement of water management

In both Gedamso and Sadi Sadi & Lafa schemes, steel gates were installed to most of the division boxes and off-takes so as to control canal water discharge to meet the water distribution schedules. The WUA board members embarked on proper water management under their responsibility. They prepared water distribution schedules. But the responsibilities of the WUA members are still vague and not understood by all the members. Therefore, farmers are not always actually punished according to the by-laws even though their behaviors are against the benefit of other WUA members.

## (3) Improvement of WUA management

No plot layout maps are available for almost any of the OIDA schemes. Therefore, the WUA cannot properly identify member farmers and irrigable plots. Under Program III, plot layout maps were prepared for the rehabilitated schemes by DAs in association of the WUAs. The WUAs recognized that the plot layout maps are useful especially for collection of water charges and other fees from member farmers. They also understood the necessity of periodical updating of the map information.

The rehabilitation works were encouraged by the WUA management. All three WUAs started holding regular meetings. In addition, the WUA committees hold meetings once or twice a month. The WUA board of Gedamso holds weekly meetings. The Gedamso WUA had an election for board members after the rehabilitation. Each of the three WUAs of the Ketar scheme successfully opened their bank accounts, in which Birr 3,000 is currently deposited.

## (4) Operation and maintenance by WUA members

The majority of the WUA members accepted their individual responsibility for canal maintenance and minor repairs of facilities although the members of the Sadi Sadi scheme do not fully accept their responsibility. The sense of project ownership was surely grown through participation in the rehabilitation works under Program III. Since then, the members generally agreed to join the maintenance works such as canal desilting. The members' participation is significantly increased after the rehabilitation works.

## (5) Irrigation water charge collection

Water charges are already being collected in the Ketar scheme. Three WUAs in the Ketar scheme regularly collect water charges of 100 Birr/ha/year for operation and maintenance. The average collection rate was around 50% of the total expected amount in the last year (2003). This year (2004), the water charge is still being collected. The WUAs of Gedamso and Lafa decided to collect water charges of 40

Birr/ha/year and 52 Birr/ha/year respectively. In the Sadi Sadi scheme, water charges are not regularly collected but contributions are occasionally collected when needed for maintenance. The members of Sadi Sadi accept this necessity although action has not been taken for water charge collection.

(6) Regular monitoring

The WUA members understand the importance of regular monitoring for project performance and identification of constraints within the scheme.

(7) Improvement of accessibility to market

Rural accessibility was focused on in the Sadi Sadi and Lafa schemes. The road conditions were improved by participation of not only the WUA members but also the local villagers through the rehabilitation works. Due to limited inputs for road repairing under Program III, however, the project impacts are still below the expectation of stakeholders.

## **6.6 Lesson Learnt**

### **6.6.1 Importance of Community Mobilization for Rehabilitation Works**

OIDA places great emphases on the rehabilitation of the existing schemes. By obtaining development funds from international agencies and donors, OIDA has implemented rehabilitation works through their staff and equipment with minimum input from local contractors. Most of the rehabilitation work aims to rectify physical constraints, i.e. replacement and repair of deteriorated facilities. Therefore, engineers play a major role in the rehabilitation and an inventory survey of existing facilities is always a first step of the rehabilitation works.

Program III was important to WUA management. In addition to the engineering aspects, it prioritized the farmers' capacity building; otherwise the facilities will deteriorate again even though full rehabilitation works are provided by OIDA. In other words, it is important to empower farmers as project owners so as to ensure the project sustainability. Instead of inventory survey of existing facilities, Program III started with problem analysis among a WUA community, who would directly confront the problems identified by all the farmers.

Program III made an attempt to verify the extreme importance of awareness creation and community mobilization prior to physical rehabilitation. Especially in Gedamso scheme (Category B), farmers were encouraged and made a decision to participate in rehabilitation works. They convinced themselves that the hardship was worth the benefits from the rehabilitation work.

At the same time, Program III confirmed that social workers of OIDA are important

stakeholders when OIDA shares the information with farmers and leads them in the right direction. Under Program I linked with Programs II and III, the skill training for several techniques such as PCM, PRA and PBME were provided to OIDA staff. The JICA Study Team recommends continuing the capacity building program of social workers so that OIDA can apply the development methodology established under Program III.

#### 6.6.2 Values of Plot Layout Maps

The most important issue in the WUA management is how to sustain fairness among members through day-to-day operation. A WUA board has to treat each of their members equally in all cases; otherwise WUA will lose members' confidence resulting in corruption of society. Even or fair distribution of natural resources is one of the basic concepts of the government project. However, land information is not available in most of the OIDA schemes. Consequently, the WUA cannot identify project beneficiaries and collect water charges from all the beneficiaries.

The Oromia state government issued a proclamation concerning maximum landholding size to be 0.50 ha/HH within an irrigation area of a government project. This means that land exchange is occasionally required among farmers when irrigation schemes are developed. Without the information of land ownership, however, it is nearly impossible to follow this government proclamation.

According to the suggestion of the JICA Study Team, OIDA DAs prepared the plot layout maps utilizing the opportunity of the rehabilitation works under Program III. It was recognized by DAs and WUAs that the plot layout maps are essential tools for fair management of the irrigation project although its preparation and updating are costly and time-consuming.

#### 6.6.3 Demarcation of Responsibilities for O&M between OIDA and WUA

Vague demarcation of responsibility for O&M of irrigation facilities between OIDA and WUA is one of the causes of low irrigation performance. Out of the three schemes Gedamso and Sadi Sadi & Lafa schemes were not officially handed over to WUA from the government. Therefore, in those schemes it was observed that WUA members had no awareness of responsibility for O&M and placed much dependency on government assistance. The rehabilitation works started with the awareness creation of WUA's responsibilities for O&M and defined the demarcation of responsibilities through PRA. Finally Program III of the Study set up clear demarcation of responsibilities at the handing over after rehabilitation.

#### 6.6.4 Necessity of DA Training

As frontline workers, OIDA DAs are crucial, especially for community-based irrigation development under the decentralization policy. A wide range of technical knowledge and experience is required for DAs, who often provide WUAs practical advice about engineering, agronomic and financial management. Under Program III, DAs were trained through full involvement in the process of rehabilitation works from community awareness creation to construction. The capacities of DAs for the three schemes were remarkably improved. The Study recommends OIDA to consider the staff training program focusing on DAs.



## CHAPTER 7

### PRELIMINARY STUDY ON THE MASTER PLAN

#### 7.1 Objectives

The Study obtained a wide range of experiences and lessons learnt through the WUA establishment under Program II and the rehabilitation works under Program III. On the basis of the experiences and the lessons learnt, the master plan was preliminarily studied to indicate to OIDA the possible directions for extension of both Programs in the future.

#### 7.2 Meki Community-based Irrigation Development Program

##### 7.2.1 Objectives

Over 460 small pumps are currently operated in Dugda Bora Wareda as mentioned in Section 4.5. Most of these pumps were introduced by private investors and used for irrigation farming with horticultural crops of high value under contract farming with small farmers of the Wareda. On the other hand, the community-based irrigation managed by WUA is limited in both number of beneficiaries and extent of service area. There are only 24 WUAs organized by 840 farmers in the Wareda to irrigate 430 ha for cereal and horticultural crops. This situation implies that on-going irrigation farming in the Wareda contributes to profits for pump owners rather than poverty alleviation for local farmers.

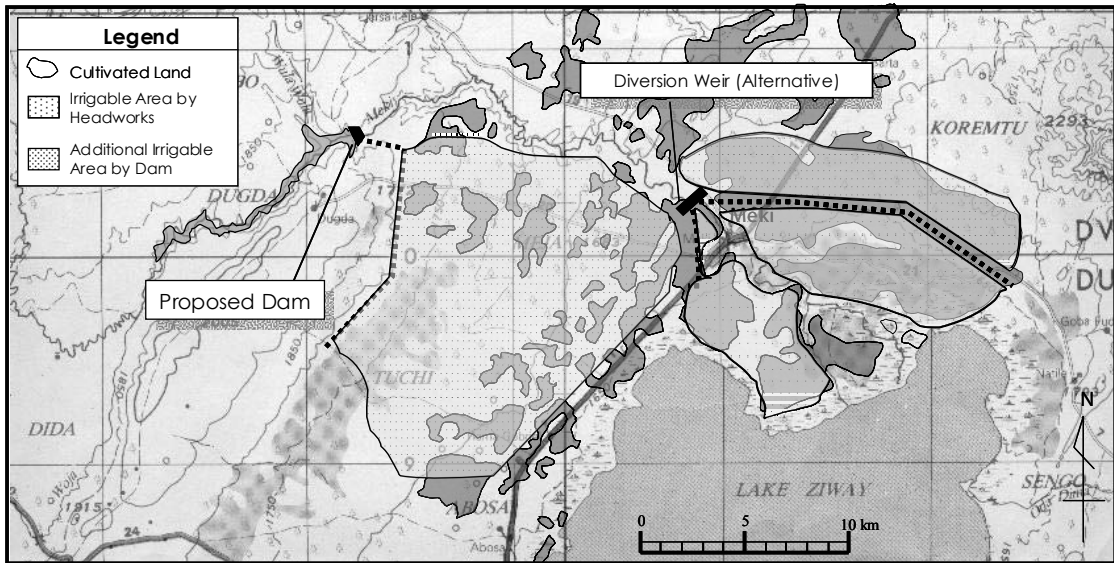
The Meki Community-based Irrigation Development Program aims at promotion of irrigation development contributing directly to the national policy, namely Sustainable Development and Poverty Reduction Program (SDPRP) by facilitating reallocation of limited water resources in the Wareda to more WUAs in line with a long-term strategy.

##### 7.2.2 Constraints against Large-scale Irrigation Development

###### (1) Large-scale irrigation development project

The irrigation development project in the Wareda was preliminarily formulated by the Government of Ethiopia in early 1990s. The original plan envisaged construction of a dam 40 m high on the Meki river and supplying irrigation water to some 8,000 ha on the northern plain of the Ziway lake. This proposed gravity system was justified in comparison with the existing Meki-Ziway pump system.

The extent of potential irrigation areas with a dam and a diversion weir are indicated below.



**General Plan of Irrigation Project Studied under the Meki Study**

The above-mentioned proposal was reviewed through the Meki study. The analyses verified adverse impacts to the hydrological condition of the lake system in the downstream, i.e. reduction in lake storages of Ziway and Abijata by 25.3% and 41.9% respectively when the dam height is 40 m. The reduction of water level can cause increased alkalinity of the Abijata lake, which may affect the bird sanctuary. The details are presented in the Final Report on the Meki Irrigation and Rural Development Project (JICA, 2002).

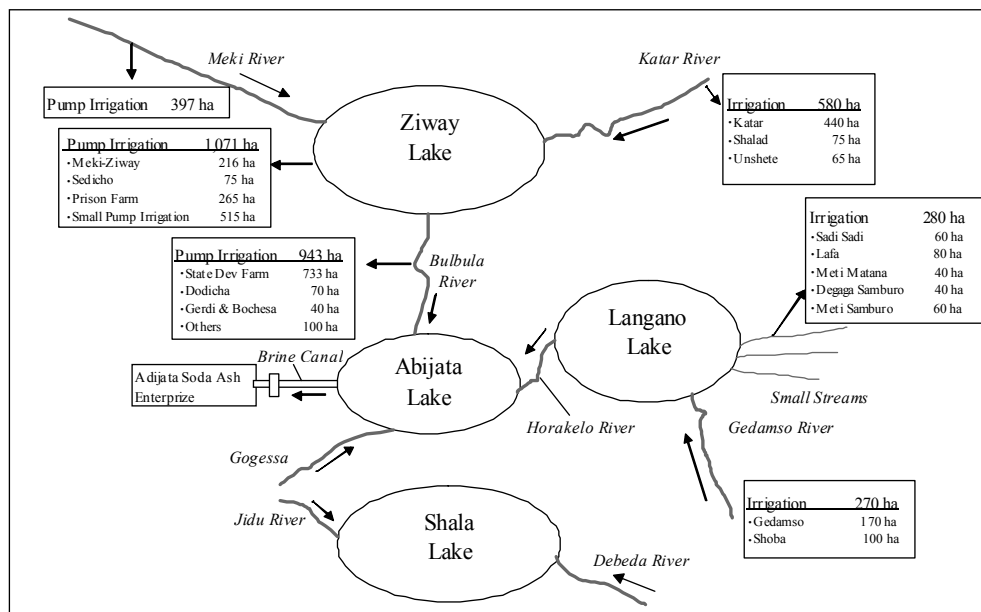
To mitigate the impacts, an alternative study was made without the proposed dam. The study preliminarily proposed a diversion weir about 3 km upstream above Meki town to irrigate 3,200 ha on the northern plan of the Ziway lake and judged its technical feasibility.

Social impacts of the alternative plan were also assessed. With a proposed diversion weir, resettlement will be required for 6,400 HHs within the irrigation area of 3,200 ha at an average holding size of 0.5 ha/HH. Land consolidation, including land exchange, for 3,200 ha will result in complex issues among rural communities.

(2) Necessity of environmental monitoring for water resource development

The environmental impact of water use in the Wareda has to be carefully assessed although current water consumption for irrigation farming is negligible in comparison with total available water. The lakes and the rivers in and around the Wareda are interconnected and form a closed hydrological system. Since water

consumption from this system will ultimately affect water recharge of the Abijata lake, the environmental monitoring is extremely important in parallel with irrigation development within the Meki-Ziway-Abijata system illustrated below.



**Meki-Ziway-Abijata System**

### 7.2.3 Basic Consideration for the Program

The Program was prepared under the following conditions.

- 1) Further expansion of the small pump irrigation will be controlled under the government authority. The pump irrigation along the Meki river will not be expanded any more taking current water availability into consideration. Instead of the Meki river, the Ziway lake and groundwater will be promising water sources. Besides, water-saving irrigation techniques will be established to mitigate the environmental impacts to the Meki-Ziway-Abijata system.
- 2) Small-scale vegetable production will be encouraged more for local community instead of commercial farms. More government support will be required to assist vegetable production by local farmers, especially input supplies. Micro-finance will need to be introduced with irrigation development through linkage with NGOs, who have skill and experience in micro-finance. Crop diversification is another important aspect to mitigate market risk for local farmers.

Efforts have to be directed to rationalization of water use within the system. Since the irrigation sector is one of the primary water users, irrigation activities in the system have to be frequently monitored and optimized under the responsibility of the regional government, especially by OIDA, in order to reduce the risk of environmental degradation and optimize irrigation water use. Under such

conditions, the following two components are proposed under the Program.

#### 7.2.4 Component 1: Promotion of WUA Establishment

In line with the Study, the Program will continue technical and institutional support to establish new WUAs by providing them opportunities to access assistance from OIDA, ESRDF and NGOs. Some 50 applications from candidate groups have been received by the OIDA Meki office. Out of the 50 groups, 30 groups, of which water sources are either the Ziway lake or groundwater, will be selected and mobilized for the community-based irrigation. The target area will be 150 ha, i.e. 5.0 ha x 30 WUAs, to be managed by 600 HHs at a standard rate of 0.25ha/HH and 20HHs/WUA as presented below.

**Future Prospect of Irrigation Schemes, Areas and WUA Members in the Wareda**

		Pump (No)	Irrigated Area (ha)	WUA members	Remarks
Community-based irrigation	Existing	24	432	839	To be sustained
	To be expanded (Component-1)	30	150	600	To be supported by OIDA, ESRDF, NGOs, etc.
Private pump irrigation*	Existing	439	1,444	-	To be replaced by WUAs
Total		493	2,026	1,439	

Data Source : OIDA Meki office

Remarks: \* It is assumed that private owners will sustain their commercial vegetable production in Meki. They will be partly replaced by community-based irrigation (WUAs).

Irresponsible water use with additional pump installations and increased pump capacity will be controlled under the Program. In this regard, the monitoring for private pump owners will be continued by OIDA

At the wareda level, the institutional arrangement will be promoted among OIDA, OADB and Oromia Cooperation Promotion Bureau (OCPB). Integration and demarcation of responsibilities of the three agencies are most important. Out of 24 WUAs assisted by OIDA, 12 WUAs comprising 500 members are currently registered as cooperative members of Cooperative Union under the control of OCPB. The members are able to access the credit scheme for procurement of farm inputs, i.e. Birr 1,000 for tomatoes (0.25 ha) and Birr 3,000 for onions (0.25 ha). Their marketing activities are also assisted. The registration of newly established WUAs in the Cooperative Union will be supported.

#### 7.2.5 Component 2: Introduction of Water-Saving Irrigation Technology

In view of the limited water resources in the Rift Valley, water use by the irrigation sector will be more efficient by introduction of water-saving irrigation techniques. The following are the main advantages of water-saving irrigation.

- 1) Irrigable area will be expanded to rain-fed farmland far from water sources. Water can be conveyed by pipes to a certain distance from the Ziway lake with minimum losses. Rain-fed farmers will obtain the chance to join irrigation farming.
- 2) Water management will be more efficient and fuel consumption will be greatly decreased.

To promote the water-saving irrigation technology in the Wareda, the following supports will be implemented by OIDA and other agencies concerned.

- 1) Irrigation research will be executed by OIDA in Meki in order to justify their technology including water management and crop maintenance. The most economical size will be optimized by selection of irrigation area, pump capacity, and related equipment requirements, including pipes and water filters.
- 2) The performance will be demonstrated in order to convince farmers the advantage of the modern system. In parallel, training will be provided to both DAs and farmers.
- 3) Financial support, especially long-term credit, will be arranged under the responsibility of the government.

#### 7.2.6 Action Plan for Water-Saving Irrigation Research

The irrigation research in Ethiopia is basically under the responsibility of the Ethiopian Agricultural Research Organization (EARO). However, an insufficient number of irrigation researchers are assigned to EARO, therefore, EARO cannot carry out irrigation research to meet the full requirements. This program aims at improvement of irrigation techniques under semi-arid conditions paying particular attention to (i) water-saving irrigation and (ii) crop diversification.

In view of limited water resources and environmental conservation, the extension of water-saving irrigation techniques is the most important issue in Oromia Region. The main research aspects include i) optimization of furrow irrigation techniques reducing water loss, ii) introduction of modern irrigation systems such as drip and sprinkler, iii) crop diversification with selection of high value crops and iv) intensive training of DAs and leading farmers.

Taking into account the past experiences in Meki, a research station with minimum facilities and equipment will be put into the Meki area and run under the control of the Research and Laboratory Team of OIDA. Not only the facilities and equipment, but also dispatch of irrigation researchers will be an essential input.

### **7.3 Existing Irrigation Schemes Rehabilitation Program in Oromia Region**

#### **7.3.1 Proposal for a Rehabilitation Program**

In view of food security and poverty reduction, irrigation development has to be encouraged more in Oromia Region. In the last decade, the government has attached top priority to irrigation development and expanded to nearly 10,000 ha by investing US\$ 7.9 million during the period from 1991 to 2000. However, a substantial extent of existing irrigation land, i.e. 4,000 ha, is not fully utilized for irrigation farming at present.

The Program aims at facilitating rehabilitation works of 96 schemes in Oromia Region through four components, namely (i) project benefit monitoring and evaluation (PBME), (ii) establishment of standard O&M rules, (iii) O&M training for DAs and WUAs and (iv) implementation of rehabilitation works. The four components will be implemented in parallel. They are summarized below.

#### **7.3.2 Component 1: Project Benefit Monitoring and Evaluation (PBME)**

Low performance of irrigation activities is caused by several factors derived from deteriorated facilities, lack of irrigation farming techniques and poor management of WUAs. PBME is important to identify such constraints prevailing in a scheme. Although PBME is a main task of DAs, farmers will be involved more in a participatory monitoring system in order to identify problems in detail and in a timely manner. The procedures for PBME have to be standardized by applying the PCM method as an effective tool. It is also important to monitor the performance after the rehabilitation to know the effects of rehabilitation and quantify the project benefits.

#### **7.3.3 Component 2 : Establishment of Standard O&M rules**

Standard O&M rules are essential. It is recommended to set up a basic principle which will clearly define that main facilities such as headworks and main canals are under the governmental responsibility, while on-farm facilities below offtakes of a main canal such as division boxes and field ditches are under the WUA's responsibility. In line with such a basic principle, further detailed demarcation will be made.

#### **7.3.4 Component 3: O&M Training for DAs and WUAs**

Great emphasis will be placed on the capacity building of DAs and WUAs to ensure daily O&M of irrigation schemes. The master plan will encourage Training of Trainers (TOT) through the following three steps with a close linkage to each other.

- Step 1 : O&M training for OIDA wareda staff and DAs
- Step 2 : O&M training for WUA leaders
- Step 3 : Awareness creation and O&M training for WUA members

The OIDA branch offices will take full responsibility for Step 1. For this purpose, PCM and PRA training will be provided at the wareda level under Step 1. Step 2 will be promoted by DAs under the initiative of the OIDA wareda offices in order to promote the leadership training within a WUA. The WUA leaders trained under Step 2, supported by DAs, will play an important role in Step 3.

#### 7.3.5 Component 4 : Implementation of Rehabilitation Works

The Study recognizes the importance of standardizing the rehabilitation works. The irrigation schemes are categorized on the basis of prevailing problems. The preliminary assessment for 96 schemes investigated in the Meki Study was made as presented in Table 7.3.1. The rehabilitation work will be continued on the basis of the experiences obtained under Program III.

Out of the 96 schemes, 28 schemes are either rehabilitated or planed to be rehabilitated. The time schedule for the rehabilitation works of OIDA is illustrated in Figure 7.3.1. The remaining 68 schemes will be subject to further rehabilitation plans.

#### 7.3.6 Action Plan for Rehabilitation Program

Program III of the Study implemented the rehabilitation of Katar, Gedamso and Sadi Sadi & Lafa schemes out of 37 schemes. Through Program III, the approach and methodology for the farmers' participatory rehabilitation work were preliminarily optimized. The proposed program will carry out the rehabilitation work as a continuation of Program III in the command area under the Central Branch Office. The implementation schedule for Components 1 to 4 will be prepared on the basis of budgetary status under the OIDA Strategic Planning and Management Plan (2003-2005). Technical and financial assistance, including provision of heavy equipment, will be required for execution of the Program.

## CHAPTER 8

### ASSESSMENT OF THE PROGRAM

#### 8.1 Objectives

The overall assessment was made to evaluate the extent to which the study achieved its objectives, that is (i) the standardization of development procedures and (ii) capacity building for the OIDA staff through the verification study. The Study firstly focused on self-assessment by the OIDA staff through the questionnaire survey. Secondly, the JICA Study Team assessed the impacts of the Study on the OIDA staff and the irrigation sub-sector of the Oromia Region by referring to the lessons learnt from Programs II and III.

#### 8.2 Participants of the Study

Some 30 OIDA staff members have continuously participated in several training activities under the Study. The training programs were carried out intensively for 10 months from May 2003 to February 2004 and followed up for two months from May to June 2004. The total participation amounted to 1,760 man-days apart from other agencies and WUA. The breakdown of the participants is summarized below.

**Number of Participants in the Study**

Aspects	Training Activities	Number of Participants
Project Cycle Management (PCM)	Problem Analysis in the Shubi-Sombo schemes established in Meki study (2001) and the Gedamso scheme under Program III	20 OIDA staff for five (5) days (100 man-days)
Participatory Rural Appraisal (PRA)	On-the-job training for six WUAs under Program II: facilitating the PRA sessions and report preparation	10 OIDA staff from Central Branch Office and Meki office for 8 months (540 man-days)
	On-the-job training for three WUAs under Program III: facilitating the PRA sessions and report preparation	10 OIDA staff from Central Branch Office and several woreda offices (880 man-days)
Project Benefit Monitoring and Evaluation (PBME)	Intensive training in the Shubi-Sombo schemes established in Meki study (2001) and learn-by-doing in six WUAs under Program II	10 OIDA staff from Central Branch Office and Meki office for 8 months (150 man-days)
Hydrology and Water Use Analyses	Hydrological observation, water use of the Meki-Ziway scheme, groundwater irrigation, inventory survey of small pump irrigation in Meki	Seven OIDA staff from Meki office for 8 months (50 man-days)
Small-scale Irrigation Facility Planning	Planning and designing of small irrigation facilities for Shubi-Sombo and six schemes under Program II	10 OIDA staff from Central Branch Office and Meki office (40 man-days)
Total		1,760 man-days



### 8.3 Self-assessment by OIDA Staff

#### 8.3.1 Questionnaire Survey

In the final stage of the Study, the JICA Study Team attempted to make a rapid assessment on impacts of capacity-building programs upon OIDA organization and staff with the following immediate objectives:

- 1) To grasp the general features of the impacts of the capacity-building programs upon OIDA staff individuals as well as work performance of OIDA through their involvement;
- 2) To assess the degree of importance and significance of the community-based approach to irrigation development implemented in Meki area, especially to assess the degree of awareness building among OIDA concerning community involvement in planning and the importance of social workers;
- 3) To evaluate the degree of importance and significance of the systematic approach to rehabilitation of existing schemes that deals with issues concerning categorization of existing schemes, problem analysis approach, scheme information management, roles of social workers, financial aspects of WUA management; and
- 4) To collect any comments and suggestions on the capacity building program in general.

The questionnaire was prepared and distributed to OIDA offices at the three administrative levels of Headquarters, Central Branch office and the Wareda offices concerned. The questionnaire was constructed with the following seven main structures; (i) general questions touching upon personal information of each respondent; (ii) questions related to the general impact through the involvement of respondents; (iii) questionnaire related to Program II with an emphasis on the approach to community-based irrigation development in OIDA; (iv) questionnaire concerned with Program III with a focus on the systematic approach to rehabilitation; (v) self-evaluation of the capacity-building program for OIDA organization and staff; (vi) comments on future support to OIDA; and (vii) general comments to the JICA Study Team. Out of 62 questionnaires distributed, a total of 31 OIDA staff responded. The respondents are summarized below.

**Respondents by Specialty**

OIDA Office	Managerial	Engineer	Socio-economy	Total
Headquarters	1	3	2	6
Central Branch Office	1	11	3	15
Wareda Offices	4	3	3	10
Total	6	17	8	31

### 8.3.2 Results of Self-assessment

#### (1) General

Through the self-assessment by the OIDA staff, the following general features are presented.

- 1) Fresh acquisition and appreciation of the PCM method in irrigation development and rehabilitation works, especially in the context of strengthening WUA.
- 2) Practical acquisition of knowledge and skills required for community-based irrigation development
- 3) Realization of an increase in water discharge through rehabilitation work within a short period of time
- 4) Building self-confidence in the community-based approach in general and application of irrigation design for standardization.
- 5) Increase in awareness of OIDA's task to strengthen WUA both in irrigation development and rehabilitation.

#### (2) Program II

The main findings in Program II are presented as follows:

- 1) The community-based irrigation development approach was acknowledged by OIDA staff as being fairly important.
- 2) Involvement of farmers from the initial stage of irrigation planning was recognized by respondents as being important.
- 3) The role of social workers in the community approach were evaluated as important, while improvement of the status of social workers was assessed as having been less well achieved in the Study.
- 4) The applicability of the guidelines for establishment of WUA was assessed as fair.

#### (3) Program III

The main findings in Program II are presented as follows:

- 1) As would be expected, the rehabilitation of existing schemes was assessed as highly important.
- 2) The problem analysis approach to rehabilitation work was acknowledged as important.

#### (4) Further capacity building programs required

It was found that four main areas of activities should be strengthened for OIDA in the future.

- 1) Research of irrigation technology
- 2) Community-based irrigation development
- 3) Water harvesting projects
- 4) Agriculture extension in irrigation schemes

The OIDA staff was also asked to provide the JICA Study Team with prioritized areas where external support is further required for OIDA. Respondents generally gave high priority to (i) research of irrigation technology, (ii) capacity-building for OIDA staff and (iii) continuous activities for community-based irrigation development. The details are presented in Annex I on Training Program for OIDA Staff (Program I).

## **8.4 Overall Assessment by the JICA Study Team**

### **8.4.1 Standardization of Development Procedures**

#### **(1) Community-based irrigation development in Meki**

ESRDF and NGOs have been introducing small-scale pump irrigation to the local communities in the Meki area since the early 1990s. The Meki study in 2000 identified that there were significant gaps in project conditions between sponsors. In addition, the Meki study noticed that project sustainability was not well considered in the on-going irrigation schemes assisted by ESRDF and NGOs. The verification study placed emphases on justification of development procedures optimized to ensure project sustainability and was carried out in order to standardize the development procedures. On the basis of the study results, the guideline was prepared for establishment of WUAs in November 2001.

The Study aimed at elaboration of the above-mentioned results of the Meki study through actual development of an additional five irrigation schemes under Program II. A wide range of lessons learnt were obtained through Program II and incorporated into the revised guideline, namely the Guideline for Establishment and Management of WUAs, of which 50 copies were first submitted in March 2004. In response to the request by the steering committee, the Guideline was translated into the Oromia language and 300 copies were distributed to four branch offices and 197 wareda offices throughout the entire Region in July 2004. Moreover, one of the NGOs working in the Meki area translated the Guideline into an Amhalic version for their use.

Under the decentralization policy, OIDA is deploying its staff more at the wareda level. The Guideline will not only assist the OIDA Meki office, but also all the OIDA staff when they facilitate the community mobilization for irrigation development followed by construction of project facilities and O&M training to

WUAs. Although further monitoring will be helpful to confirm the applicability of the Guideline, the Study was able to work out the standardized procedures for community-based irrigation development.

## (2) Rehabilitation of existing schemes

The JICA Study Team considered that different approaches should be utilized taking the causes of lower irrigation performance into consideration. Under this assumption, the Study categorized the existing schemes into three groups, namely, Category A of which the main constraint is deteriorated facilities, Category B characterized by weak WUA management and Category C having other complex constraints.

Out of the 37 schemes under the Central Branch Offices, three were selected, one from each of the above-mentioned categories and provided with the necessary rehabilitation works. The rehabilitation of Category A was initiated by inventory of project facilities to identify deteriorated facilities and their prioritization, while problem analysis was first carried out for Categories B and C. Through Program III, it was recognized that the problem analysis is extremely important at the earliest stage of PRA for any categories of A, B or C. Although physical rehabilitation works will be the main focus for Category A, of which constraints are clearly understood among the WUA members, the problem analysis should still be carried out as the first step of the rehabilitation. In this regard, the PCM methodology, of which the training program was intensively provided to the OIDA staff, will be the main tool for the rehabilitation works of the existing schemes.

Within the concept of project cycle management, PBME is a universal tool for all of the irrigation projects to identify constraints at the earliest stage and set up countermeasures. The Study made attempts to verify the importance of plot maps and lists, which will provide clearer information to help DAs and WUA committees in conducting monitoring.

### 8.4.2 Impacts for OIDA Staff and Local Communities

#### (1) Growing recognition of the bottom-up approach

The participatory planning through PRA was recognized as a suitable approach for community-based irrigation projects. The PCM method was also accepted by the OIDA staff as an essential tool for the bottom-up approach of irrigation development to identify constraints, select appropriate measures and mobilize communities. As clarified by the self-assessment, the OIDA staff seeks further training in the PCM method. This growing recognition of the bottom-up approach will rationalize the direction of the irrigation sector of the Region.

(2) Status of social workers within the OIDA organization

In connection with the above-mentioned, the status of social workers within the OIDA organization will also be improved. Their status was previously thought to be less important compared to the engineers.

(3) Impacts to local communities by frequent visits of the OIDA staff

There is a significant gap of confidence between OIDA and the local communities. Through the Meki study and the present Study, the OIDA Meki office frequently visited villages to empower communities, provide information about JICA's activities in Meki and assist preparation of project application. As a result of these efforts by the staff, the OIDA Meki office has obtained the farmers' confidence. Farmers now tend to frequently visit the OIDA Meki office for consultation and acquisition of technical advice.

(4) Growing recognition of environmental conservation

The irrigation sub-sector is the largest water consumer in the Rift Valley system, in which the environment is fragile and vulnerable to irreversible degradation. The extremely low discharge of the Meki river in the dry months reminds the OIDA staff of the adverse impact of rapid expansion of irrigation areas. Although the priority among the OIDA's tasks is development, the OIDA Meki staff started paying more attention to environmental conservation.

(5) Close relation among OIDA headquarters, branch offices and woreda offices

For successful operation under the decentralization policy, the demarcation of authority and responsibility between OIDA headquarters, branch offices and woreda offices should be optimized. The day-to-day operations under Programs II and III provided diversity of lessons learnt in this regard. Communication among the three parties was closely maintained to share a diversity of information about project implementation.

# Tables

**Table 2.6.1 Summary of Contents of Assistance by Donors**

Donors	Mode of Intervention	Main Project Components	Size of Assistance
IFAD	(i) Construction of new irrigation schemes (ii) Rehabilitation of existing schemes	1. Small-scale irrigation development 2. Capacity building 3. Water Users Association and Cooperative promotion 4. Agricultural support service 5. Rural women and vegetable garden development	US\$ 7.07 million  5 years
AFD	Construction of new irrigation schemes	1. Study and design of small-scale irrigation schemes 2. Construction of small-scale irrigation schemes 3. Provision of technical equipments (office, surveying and hydrological), heavy duty machineries and light vehicles 4. Technical assistance including provision of consultancy services and trainings	Approximately 17.4 million in Francs (US\$ 3.3 million)  5 years (2000 to 2005)
UNDP	Program approach	1. Capacity-building programs including development of regional database, networking between head office and branch offices 2. Rehabilitation of existing schemes 3. Community (WUA) training 4. Water harvesting project	Birr 3.7 million  4 years 2003-2006
Ethio - Italy Cooperation (Arsi-Bale Project)	(i) Construction of new irrigation schemes (ii) Rehabilitation of existing schemes	1) Small-scale irrigation development 2) Capacity building 3) WUA support 4) Supply of fertilizer	Birr 1 to 5 million including small to medium rural water supply projects
FAO	Rehabilitation of existing schemes	1) Civil works 2) DAs and WUA training	US\$ 53,000 for 2003/2004 (1996 E.C.).
ADB	Construction of new schemes	Not finalized	Not known

Sources: Planning and Information Management Service, OIDA Head Office

**Table 3.2.1 Soils of the Study Area and Distribution of Coverage Area**

Soils	North Shoa	East Shoa	West & Southwest Shoa	Arsi	The Study Area	Oromia Region
Coverage Area (km <sup>2</sup> )	11,579	14,044	21,970	24,022	71,615	359,620
Pellic Vertisols	40.7%	10.3%	37.4%	23.7%	27.5%	8.1%
Chromic Vertisols	0.9%	5.0%	4.2%	3.3%	3.5%	9.2%
Eutric Cambisols	10.0%	4.6%	6.9%	15.1%	9.8%	14.5%
Vertic Cambisols	8.4%	7.1%	2.8%	4.5%	5.1%	2.2%
Chromic Cambisols	3.0%	0.4%	2.6%	5.5%	3.2%	10.6%
Eutric Nitosols	7.2%	1.6%	10.2%	6.6%	6.7%	4.9%
Dystric Nitosols	0.0%	0.0%	6.2%	0.0%	1.8%	11.5%
Chromic Luvisols	7.3%	2.6%	10.8%	7.3%	7.4%	5.1%
Eutric Fluvisols	0.0%	10.2%	3.5%	2.3%	3.9%	4.4%
Vitric Andosols	0.0%	23.8%	0.0%	6.6%	7.2%	1.5%
Luvic Phaeozems	0.0%	8.3%	0.0%	0.1%	1.7%	0.3%
Cambic Arenosols	7.9%	0.0%	0.0%	2.2%	2.0%	0.9%
Lithosols	9.2%	10.5%	11.7%	13.2%	11.6%	5.4%
Rock Surface	3.5%	4.3%	1.2%	3.7%	3.0%	1.4%
Lake	0.0%	8.1%	0.1%	0.8%	2.0%	0.8%
Others	1.8%	3.2%	2.5%	5.1%	3.5%	19.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source : Oromia Bureau of Finance and Economic Development, March 2003



**Table 3.3.1 Cultivated Area, Production and Yield in the Study Area (2001/2002)**  
(1/2)

Crop Type and Name	North Showa			East Showa			West Showa		
	Cultivated Area (ha)	Production (t)	Yield (t/ha)	Cultivated Area (ha)	Production (t)	Yield (t/ha)	Cultivated Area (ha)	Production (t)	Yield (t/ha)
<b>Cereals</b>									
Teff	87,257	70,895	0.81	118,591	98,304	0.83	203,813	227,217	1.11
Barley	78,071	57,675	0.74	13,004	18,401	1.42	69,339	88,104	1.27
Wheat	40,773	42,172	1.03	59,355	91,804	1.55	83,926	130,598	1.56
Maize	6,197	8,020	1.29	141,941	308,031	2.17	77,044	204,139	2.65
Sorghum	45,603	55,275	1.21	11,956	14,730	1.23	46,198	80,224	1.74
Finger Millet	83	77	0.93	1,061	976	0.92	845	1,425	1.69
Oats/"Aja"	1,149	765	0.67	198	254	1.29	1,292	1,406	1.09
Rice									
<b>Sub-Total</b>	<b>259,132</b>	<b>234,879</b>		<b>346,105</b>	<b>532,500</b>		<b>482,457</b>	<b>733,113</b>	
<b>Pulses</b>									
Broad beans	28,334	26,354	0.93	7,060	7,740	1.10	25,477	36,709	1.44
Field peas	8,184	4,139	0.51	5,539	4,679	0.84	8,070	8,817	1.09
Haricot beans	58	32	0.55	26,786	21,768	0.81	556	210	0.38
Chickpeas	6,515	6,576	1.01	13,820	16,403	1.19	27,408	29,113	1.06
Lentils	7,077	4,263	0.60	2,939	1,903	0.65	2,198	1,421	0.65
Vetch	5,567	6,366	1.14	2,885	3,203	1.11	11,393	14,781	1.30
Soya beans		0			0		18	4	0.22
Fenugreek	350	165	0.47	729	433	0.59	1,407	827	0.59
<b>Sub-Total</b>	<b>55,735</b>	<b>47,730</b>		<b>59,029</b>	<b>55,696</b>		<b>76,527</b>	<b>91,882</b>	
<b>Oilseed</b>									
Neug.	3,975	10,661	2.68	8	9	1.13	21,396	78,492	3.67
Linseed	4,081	16,592	4.07	110	435	3.95	11,937	65,986	5.53
Groundnuts									
Safflower	297	2,327	7.84	57	321	5.63	125	1,143	9.14
Sesame				705	4,282	6.07			
Rapeseed	32			150	881	5.87	1,670	15,217	9.11
<b>Sub-Total</b>	<b>8,385</b>	<b>29,580</b>		<b>1,030</b>	<b>5,928</b>		<b>35,128</b>	<b>160,838</b>	
<b>Vegetable</b>									
Lettuce									
Head cabbage				99	752	7.60	88	530	6.02
Ethiopian cabbage	56	315	5.63	753	6,760	8.98	401	3,438	8.57
Tomatoes				827	5,838	7.06	282	3,341	11.85
Green peppers	173	787	4.55	424	3,297	7.78	397	3,569	8.99
Red peppers	219	308	1.41	1,950	4,664	2.39	3,331	4,507	1.35
Swiss chard				1	11	11.00	11	79	7.18
<b>Sub-Total</b>	<b>448</b>	<b>1,410</b>		<b>4,054</b>	<b>21,322</b>		<b>4,510</b>	<b>15,464</b>	
<b>Root Crops</b>									
Beetroot	4	38	9.50	70	687	9.81	92	423	4.60
Carrots				79	799	10.11	50	397	7.94
Onions	166	1,480	8.92	855	6,528	7.64	869	8,567	9.86
Potatoes	138			12,022	68,402	5.69	12,027	19,677	1.64
Garlic	208	2,345	11.27	78	875	11.22	442	5,734	12.97
Taro/"Godere"							11	91	8.27
Sweet potatoes	2			23	198	8.61	104	873	8.39
<b>Sub-Total</b>	<b>518</b>	<b>3,863</b>		<b>13,127</b>	<b>77,489</b>		<b>13,595</b>	<b>35,762</b>	
<b>Ground Total</b>	<b>324,218</b>	<b>317,462</b>		<b>423,345</b>	<b>692,935</b>		<b>612,217</b>	<b>1,037,059</b>	

Data Source : Statistical Report on Area and Production of Temporary Crops, Central Agricultural Census Commission, July 2003

**Table 3.3.1 Cultivated Area, Production and Yield in the Study Area (2001/2002)**  
(2/2)

Crop Type and Name	Arsi			Study Area Total			Oromia Total		
	Cultivated Area (ha)	Production (t)	Yield (t/ha)	Cultivated Area (ha)	Production (t)	Yield (t/ha)	Cultivated Area (ha)	Production (t)	Yield (t/ha)
<b>Cereals</b>									
Teff	60,121	53,962	0.90	469,782	450,378	0.96	800,440	723,405	0.90
Barley	149,171	183,330	1.23	309,585	347,510	1.12	474,559	501,041	1.06
Wheat	206,174	344,384	1.67	390,228	608,958	1.56	609,912	883,575	1.45
Maize	76,724	159,280	2.08	301,905	679,470	2.25	906,267	1,745,066	1.93
Sorghum	25,060	50,488	2.01	128,816	200,717	1.56	462,913	650,030	1.40
Finger Millet	269	239	0.89	2,259	2,717	1.20	50,065	54,996	1.10
Oats/"Aja"	4,585	4,938	1.08	7,223	7,363	1.02	29,275	25,640	0.88
Rice							594	957	1.61
<b>Sub-Total</b>	<b>522,104</b>	<b>796,621</b>		<b>1,609,798</b>	<b>2,297,113</b>		<b>3,334,025</b>	<b>4,584,710</b>	
<b>Pulses</b>									
Broad beans	28,092	41,690	1.48	88,963	112,493	1.26	140,258	168,543	1.20
Field peas	23,411	13,022	0.56	45,204	30,657	0.68	84,003	58,901	0.70
Haricot beans	9,482	7,598	0.80	36,882	29,608	0.80	98,218	69,700	0.71
Chickpeas	994	905	0.91	48,737	52,997	1.09	56,943	59,087	1.04
Lentils	844	294	0.35	13,058	7,881	0.60	15,740	8,881	0.56
Vetch	1,511	1,314	0.87	21,356	25,664	1.20	22,517	26,638	1.18
Soya beans	49	83	1.69	67	87	1.30	286	146	0.51
Fenugreek	567	437	0.77	3,053	1,862	0.61	10,368	4,240	0.41
<b>Sub-Total</b>	<b>64,334</b>	<b>65,343</b>		<b>254,200</b>	<b>259,300</b>		<b>428,333</b>	<b>396,136</b>	
<b>Oilseed</b>									
Neug.	4,426	2,355	0.53	29,805	91,517	3.07	94,157	327,595	3.48
Linseed	32,718	19,510	0.60	48,846	102,523	2.10	73,292	397,268	5.42
Groundnuts				0	0		10,183	78,112	7.67
Safflower	89	61	0.69	568	3,852	6.78	926	6,151	6.64
Sesame	43	31	0.72	748	4,313	5.77	10,221	66,057	6.46
Rapeseed	818	664	0.81	2,670	16,762	6.28	5,557	44,323	7.98
<b>Sub-Total</b>	<b>38,094</b>	<b>22,621</b>		<b>82,637</b>	<b>218,967</b>		<b>194,336</b>	<b>919,506</b>	
<b>Vegetable</b>									
Lettuce							151	1,072	7.10
Head cabbage	80	445	5.56	267	1,727	6.47	609	4,672	7.67
Ethiopian cabbage	864	6,958	8.05	2,074	17,471	8.42	8,046	63,351	7.87
Tomatoes				1,109	9,179	8.28	1,995	16,991	8.52
Green peppers	223	1,374	6.16	1,217	9,027	7.42	2,707	21,999	8.13
Red peppers	2,277	1,890	0.83	7,777	11,369	1.46	21,437	29,728	1.39
Swiss chard				12	90	7.50	45	479	10.64
<b>Sub-Total</b>	<b>3,444</b>	<b>10,667</b>		<b>12,456</b>	<b>48,863</b>		<b>34,839</b>	<b>137,220</b>	
<b>Root Crops</b>									
Beetroot	86	701	8.15	252	1,849	7.34	479	3,737	7.80
Carrots	126	773	6.13	255	1,969	7.72	390	3,306	8.48
Onions	4,624	33,849	7.32	6,514	50,424	7.74	12,028	103,025	8.57
Potatoes	13,827	39,626	2.87	38,014	127,705	3.36	53,964	228,961	4.24
Garlic	677	8,060	11.91	1,405	17,014	12.11	2,406	28,846	11.99
Taro/"Godere"	3			14	91	6.50	6,148	47,106	7.66
Sweet potatoes	452	2,222	4.92	581	3,293	5.67	10,841	101,572	9.37
<b>Sub-Total</b>	<b>19,795</b>	<b>85,231</b>		<b>47,035</b>	<b>202,345</b>		<b>85,777</b>	<b>512,816</b>	
<b>Ground Total</b>	<b>647,771</b>	<b>980,483</b>		<b>2,006,126</b>	<b>3,026,588</b>		<b>4,077,310</b>	<b>6,550,388</b>	

Data Source : Statistical Report on Area and Production of Temporary Crops, Central Agricultural Census Commission, July 2003

**Table 3.3.2 Distribution of Rural Households by Domestic Expenditure Classification**

Category of Domestic Expenditure (Birr/year)	Ethiopia		Oromia		Addis Ababa	
	Distribution (%)	Cumulative (%)	Distribution (%)	Cumulative (%)	Distribution (%)	Cumulative (%)
Below 600	0.1	0.1	0.1	0.1	0	0.0
600 - 999	0.8	0.9	0.6	0.7	0.3	0.3
1,000 - 1,399	1.9	2.8	1.4	2.1	0.6	0.9
1,400 - 1,999	5.2	8.0	3.5	5.6	0.6	1.5
2,000 - 2,599	8.6	16.6	5.8	11.4	2.5	4.0
2,600 - 3,399	15.0	31.6	13.4	24.8	2.1	6.1
3,400 - 4,199	15.9	47.5	15.9	40.7	10.7	16.8
4,200 - 5,399	19.3	66.8	20.5	61.2	13.1	29.9
5,400 - 6,599	12.7	79.5	14.0	75.2	13.2	43.1
6,600 - 8,999	12.0	91.5	14.5	89.7	23.0	66.1
9,000 - 12,599	5.9	97.4	7.2	96.9	19.0	85.1
12,600 - 16,199	1.6	99.0	2.3	99.2	8.7	93.8
16,200 - 19,999	0.4	99.4	0.5	99.7	3.7	97.5
20,000 and Over	0.6	100.0	0.3	100.0	2.5	100.0
Total	100.0		100.0		100.0	

Source : Report on the 1999/2000 Household Income, Consumption and Expenditure Survey  
Central Statistical Authority, February 2001

**Table 6.2.1 List of Existing Irrigation Schemes under OIDA Central Branch Office**

Name of Scheme	Location		Area Development			Number of Beneficiaries			Completed	Facility Status/1	WUA Status/2	Water Sources	Intake Structure	Site Location/3	Category/4
	Zone	District	Plan	Actual	%	Plan	Actual	%							
1 Kawa	Arsi	Gedeb	200	20	10	500	80	16	1985	D	C	River	Pump	Out	C
2 Meti Metana	Arsi	Munesa	40	30	76	160	140	88	1993	B	C	River	Headworks	In	B
3 Sadi Sadi	Arsi	Munesa	60	30	50	221	221	100	1995	C	C	Spring	Headworks	In	C
4 Arata Chufa	Arsi	Ziway Dugda	100	80	80	317	250	79	1993	B	A	River	Headworks	In	D
5 Shalad-01	Arsi	Tiyo	50	47	94	196	184	94	1995	A	A	Spring	Headworks	In	D
6 Shalad-02	Arsi	Tiyo	25	0	0	100	0	0	1995	D	D	Spring	Headworks	In	C
7 Bosh-01	Arsi	Tiyo	100	60	60	233	320	137	1993	C	C	Spring	Headworks	In	C
8 Bosh-02	Arsi	Tiyo	60	35	58	220	140	64	1994	C	C	Spring	Headworks	In	C
9 Shoba	Arsi	Munesa	100	60	60	279	270	97	1993	C	B	Spring	Headworks	In	A
10 Gedamso-01	Arsi	Munesa	80	58	72	250	73	29	1996	A	C	River	Headworks	In	B
11 Gedamso-02	Arsi	Munesa	90	10	11	320	20	6	1997	B	C	River	Headworks	In	B
12 Lafa	Arsi	Munesa	80	40	50	150	140	93	1997	C	C	River	Headworks	In	C
13 Sole Bakekisa	Arsi	Tena	100	40	40	300	150	50	1998	D	C	River	Headworks	In	C
14 Meti Samburo	Arsi	Munesa	60	40	67	160	164	103	1993	B	B	River	Headworks	In	D
15 Dagaga Samburo	Arsi	Munesa	40	20	50	60	40	67	1996	C	B	River	Headworks	In	A
16 Ketar-01	Arsi	Tiyo	110	55	50	400	120	30	1987	C	A	River	Headworks	In	A
17 Ketar-02	Arsi	Tiyo	200	100	50	200	200	100	1993	C	A	River	Headworks	In	A
18 Ketar-03	Arsi	Tiyo	90	45	50	360	0	0	1992	C	A	River	Headworks	In	A
19 Hasen Usman	Arsi	Tena	230	280	122	527	1,000	190	1994	A	B	River	Headworks	Out	D
20 Homba	Arsi	Merti	100	10	10	400	40	10	-	D	C	River	Headworks	Out	C
21 Teltele	N. Shoa	Detre Libanes	90	145	161	418	220	53	1996	A	C	Spring	Headworks	Out	B
22 Lami	N. Shoa	Yaya Gulale	30	56	187	200	225	113	1996	A	B	Spring	Headworks	Out	D
23 Indris	W. Shoa	Ambo	175	380	217	875	1,087	124	1993	A	B	River	Headworks	Out	D
24 Laku	W. Shoa	Bako-Tibe	50	6	12	40	9	23	1994	D	D	River	Headworks	Out	C
25 Walga	W. Shoa	Wanchi & Waliso	150	518	345	637	1,070	168	1998	A	B	River	Headworks	Out	D
26 Walshamo	W. Shoa	Chaliya	50	0	0	160	0	0	1995	D	D	River	Headworks	Out	C
27 Robi	W. Shoa	Meta Robi	120	123	103	410	410	100	1998	A	C	River	Headworks	Out	B
28 Chole	W. Shoa	Ambo	100	200	200	464	500	108	1996	A	B	River	Headworks	Out	D
29 Lugo	E. Shoa	Fentale	57	53	93	70	64	91	1996	A	B	River	Headworks	Out	D
30 Sogido Bandira-01,02	E. Shoa	Fentale	140	110	79	117	65	56	1998	B	C	River	Headworks	Out	B
31 Godino	E. Shoa	Adama	219	183	84	270	182	67	1996	A	C	River	Dam	In	B
32 Balbala	E. Shoa	Adama	100	42	42	400	182	46	1996	C	C	River	Dam	In	C
33 Fultino	E. Shoa	Adama	85	33	39	182	165	91	1998	D	C	River	Dam	In	C
34 Laftu	E. Shoa	Shashamene	30	3	8	60	14	23	1996	D	D	River	Headworks	Out	C
35 Kararo Arsi	E. Shoa	Arsi Negele	42	38	90	253	85	34	1990	A	B	River	Headworks	Out	D
36 Tiliku Debeda	E. Shoa	Arsi Negele	50	25	51	200	101	51	1995	C	D	River	Headworks	Out	C
37 Meki-Zway	E. Shoa	Meki & Duguda-Bora	1,500	33	2	3,375	132	4	1984	D	D	Lake	Pump	In	C
Total			4,903	3,008	61	13,484	8,063	60							

Note: /1 Evaluation of facility status, A~D (fully functioning~ deteriorated)

/2 Evaluation of WUA activities, A~D (very active ~ poor)

/3 Site location, In or Out / within or out of 100km from Addis Ababa

/4 Category, A~D (A:deterioration of facilities, B:weak WUA management, C:A+B or other constraints, D:functioning at reasonable level)

**Table 6.4.1 Findings in Existing Facilities and Required Rehabilitation Works in Ketar Scheme (1/2)**

Existing Facilities		Findings	Required Rehabilitation Works
Conveyance Canal	Sheet metal flume	The section at the inlet and outlet from the flume have leakage and has inspected it is due to long age of the construction between the metal sheet and concrete.	Well finishing at the joints and the transitions is proposed and also the outlet pool has to be plastered for better future life of the system
		Leakage in flume section at pillar no 11 is observed. Moreover the sheet metal is exposed to wearing because of the existing anti rust is out of use. In addition to that some broken bracing are observed.	Welding the flume section and bracing are main important activities in this rehabilitation program. And provision of anti rust to the whole section of the flume is proposed.
	Lined canal	Generally the canal is long age thus, it is deteriorated and creates leakage along the main canal.	Provide chiseling and apply plaster at internal and external side of the canal.
		The external side of the canal is neither pointed nor plastered, thus this also exaggerates the leakage. In addition to that the shape and depth of the external sidewall is not extending to the foundation depth.	As far as the topography allows apply pointing to the external face of the canal.
		Gully is developed at chainage 0+477 at the right side of the canal	Retaining wall is proposed.
		After chainage 1+500 most of the left side canal is earthen and it is shapeless, and broken. This resulted to long travel time to reach the command area and also most of the water is pooled in the canal and exposed to leakage and other losses.	Provision of regular shape by providing lined canal is proposed, even if the excavation is difficult.
		From chainage 1+740 to 2+180 the canal passes through very loose fine ash soil material and this material makes caves. And the canal is maintained frequently, but still there are serious cracks along 3.5-meter depth canal foundation.	This issue is the major risk of this project and solving the problem to the grass roots is important. For this effect the following options are discussed in the field and also with experts participated in the construction of the project 20 years back and other experts involved in the foundation material. <ul style="list-style-type: none"> <li>• Change the route of the canal to the left side; this will need the mobilization of heavy machineries to the site.</li> <li>• Building lightweight flumes, this has problem in getting reasonable depth of footing.</li> <li>• Provision of Gabion masonry cut off at the right side of the canal and substitute the existing earth between the canal and the Gabion by selected material.</li> </ul> Option one is adapted to the sustainability of the system as well as construction and operation easiness
		The gate provided for the Spillway at chainage 4+700 is out of order, thus regulation is by the use of local materials	Replacement of the existing gate has to be made.

**Table 6.4.1 Findings in Existing Facilities and Required Rehabilitation Works in Ketar Scheme (2/2)**

Existing Facilities		Findings	Required Rehabilitation Works
Conveyance Canal	Lined canal	The Division box at chainage 6+981 to wards Golja is not provided with gate, thus it needs provision and the gate towards the pond is provided with gate, but it needs spindle to operate easily.	Provide gate for the canal towards Golja and maintain the gate to the pond
Field Structures	Culverts	At the more densely cattle paths to the river, culverts were not provided across the main canal. As a result, the non-beneficiaries place stones in the canal and will allow their cattle to pass the river. Therefore according to the observation three culverts are required at the following two locations.	Provisions of culverts at chainage 2+588, 4+618 and 6+900 are recommended.
	Division Boxes	-	Nil
	Flume	-	Nil
	River Crossing	-	Nil
Water Pond/Night Storage	Pond body	At chainage 7+200 water storage pond exists and the purpose is to supply drinking water as well as for cattle's for the Goljota town. And this pond inlet is provided with energy dissipater but at the discharging point is worn out, thus it is proposed for maintenance.	The importance of pond is for drinking and this topic is out of the scope of irrigation project, but for keeping the existing system with out any interruption at the down stream the maintenance has to be provided.
	Inlet Structure	The embankment fill at the top of the pond is eroded and the existing pond capacity is below the spillway level. And this also creates scarcity of water at the down stream users and creates water stress.	Level survey is conducted along the bank top level and it shows level variation of 4m between the eroded part and the constructed bank top level. To this effect compacted fill work is recommended up to the existing pool bank top level.
	Outlet Gate and Spillway		Nil

**Table 6.4.2 Findings in Existing Facilities and Required Rehabilitation Works in Gedamso Scheme (1/3)**

Existing Facilities		Findings	Required Rehabilitation Works
Headwork	Left side wing wall extension	In the left bank of the headwork the flood is passing behind the wing wall structure therefore, it scour the weir .In addition to that it will be difficult to get water in the direction of the intake (i.e. right side of the head work) in the dry period of the year.	Extension of the left bank wing wall to the end of abutment is proposed so as to avoid the escape of water in the dry season behind the wing wall as well as to avoid scouring of the structure in this free end embankment. Therefore to this effect the cross section of the existing retaining wall section is extended as a measure
	Sluice gate	The sluice gate, which uses to remove accumulated sediments behind the weir, is not functioning properly, because wood logs carried by flood damaged it. Therefore in irrigation period filling sacks of sands behind the sluice gate bottom is applied to use the system with minimum leakage. And this creates sediments intrusion in the canal, hence it created a lot of problems in the system, even if there is Silt trap Basin. According to the beneficiaries the sluice gate has not functioned effectively in its life. This is due to the fact that the community has no concept to the function and operation of the gate.	To mitigate this replace the existing sluice gate and provide it with trash racks to avoid any bounce on the gate. Training regarding operation skill has to be given for the community.
Conveyance Canal	Intake to Division Box 1  (0+000 - 1+037)	The main canal, which runs from the Intake to Division Box No 1, has impounding behavior, and so the flow is not flowing in the required rate to reach Division Box .No 1 At chainage between 0+800 - 0+900 the canal bed has a slope of 1/4760m/m, which is almost, nil, hence pooling in canal is created between chainage 0+750 - 0+800 and over flowing at the canal top is observed at around chainage 0+725. In addition to that the Box Culvert inlet crown level is placed at a higher level this also have an impact to impoundment of water in the canal as well as over topping the canal.	The canal slope should be made to join the bed slope of chainage 0+500 and 1+025(i.e. Box Culvert inlet) this rises the canal bed slope to 1/746m/m. The adjustment of the canal bed slope will raise the canal bank top level and this is shown in the proposed working drawing profile. The earth canal section between Division Box 1 and Intake is located at chainage 0+975-1+025has to be lined so as to avoid canal damage and to increase the canal efficiency.
	Division Box 1 to Division Box 2 (1+037 - 1+625)	During the daily routine maintenance of earth canal the design bed slope will not be achieved with out level survey instrument, therefore the flow detention period is long as well as reduce the efficiency of irrigation.	To facilitate the daily routine maintenance of the canal bed trapezoidal section lined canal mark is proposed at interval of 50m..
	Division Box 2 to Night Storage (1+625 - 3+699)	1+625-1+810: Canal is pooled, and flow rate and speed are very small 2+100-2+286 : Seepage to the adjacent command area 3+069-3+080: Canal is broken 3+557-3+688: Cavity hall formed	Lined Canal

**Table 6.4.2 Findings in Existing Facilities and Required Rehabilitation Works in Gedamso Scheme (2/3)**

Existing Facilities		Findings	Required Rehabilitation Works
Distribution Canal	Secondary Canals	As it is shown in the schematic lay out the project (Gedamso 01 and Gedamso 02) have four secondary canals, which are SC1, SC2, SC3, and SC4. As per the community problem indicates water is pooled in the SC4 canal between chainage 0+000-0+250.	Level survey is conducted to check the flow as well as the canal bed level in the above chainage, and it is found as a problem of daily routine maintenance management. But to facilitate the maintenance benchmark is proposed in the canal bed. In addition to that due attention has to be given in the activity of operation and maintenance of the system.
	Tertiary and Quaternary Canals	TC2-2:0+105-0+382 Water is pooled in the canal. Canal is in fill but it is collapsed at the bed, therefore the slope and the section are changed from the designed.	Lined Canal
		TC4-4:0+253-0+337 Canal is broken. Drainage canal is filled by sediments and it overflows to this canal.	Lined Canal
		TC4-4:0+907-1+741 Canal is broken and filled by sediments. All tertiary canals, except TC4 are drained in this system. Because the secondary drain fills frequently.	Lined Canal
		QC4-4-1- 4-4-12: Canals are not available in cut and /or fill. It is not used for the anticipated target since the project implementation	Provide canal excavation and compacted fill.
Field Structures	Division Boxes	Division Boxes terminology is used to structures which divide water from the main canal to the secondary canal. And the masonry box structure and gates provides water control in the main canal.  Division Box 1 and 2 (At chainage 1+037, and 1+625): At this structure only the secondary canal inlet is provided with gate and more water is released towards this secondary canal. The gate is operated well, for full and/or zero flow rates only, but in the controlling of the gate for flow rate in between, it is impossible. Due to the gate is out of order for this purpose.	At the secondary canal inlet gate ring has to be welded so that the use of keys is possible and controlling the flow rate at any level will be possible.  Provision of gate to the main continuing canal is also recommended to make the management easy and to be safe in case of failure of one gate
	Off-takes (Turnouts)	The name Turnouts and Off takes are used for the same purpose in this project, but for identification it is assumed Off takes are those placed on secondary and tertiary canals and supply to field ditch is not allowed directly from these canals.  The major problem of the Off takes is lack of gate, and this creates a problem in water management. In addition to that cracks at the pipe outlets are observed	Steel gates are proposed in each of the structures so as to increase efficiency of the project and to avoid the observed water scarcity. And as preventive measure to cracking it is recommended to chisel the cracked area and provide plastering.  Additional Offtakes are proposed at the following locations so as to improve the water management of the system.
	Drops	In general most of the drops have cracks at the joints between the canal protection wing wall and vertical face of the drop. And drops in Quaternary canal 4-4-3 to 4-4-12 are filled by soils, because the system is not used for irrigation since the project implementation.	Chiseling widely around the cracked area and apply three coats of plaster is proposed, And also if it is serious remove the part and provide new masonry.



**Table 6.4.2 Findings in Existing Facilities and Required Rehabilitation Works in Gedamso Scheme (3/3)**

Existing Facilities	Findings	Required Rehabilitation Activities
Culverts	Culverts are provided systematically in the project, but now the community changes their settlement from the previous places and this makes the requirement of additional culvert at two locations..	Provision of culverts at chainage 1+857 and 3+410 and serious maintenance at TC 4-4 at chainage 0+151 are recommended.
Night Storage Pond and Fence	Along the joints of the Night Storage Pond inlet, cracks are observed. And the out let gate is out of order, thus the community uses sacks of sands for closing and opening the out flow from the Night Storage Pond.	It is proposed to plaster the Inlet canal and to replace the outlet gate.
	Night storage pond fence was constructed using wooden poles and barbed wire, but now termites attack the pole and it is failed. Thus the pond is exposed to different activities and these interventions affect the water availability in the pond and its life to Gedamso 02 project.	Fencing with angle iron poles and barbed wire is proposed.
River Crossings and Protections	The river crossing which is located on the main canal at chainage 0+106 is eroded at the down stream part of the river crossing structure where the flood is discharged. Therefore before exposing the structure to risk attention has to be given	Gabion protection is proposed and the sketch is attached in annex. In addition to that to decrease the load on this stream some of drain is lead to enter before the headwork and a catch drain of 45 meter is proposed.
	In the main canal at chainage 0+175 big gully is developed and it expands towards the canal from the river, This will creates serious problem in the future sustainability of the system	It is proposed to cease the expansion of the gully and to stabilize the developed gullies from further expansion by providing Gabions across the gully.

**Table 6.4.3 Findings in Existing Facilities and Required Rehabilitation Works in Sadi Sadi & Lafa Schemes (1/3)**

1. Sadi Sadi Scheme

Existing Facilities		Findings	Required Rehabilitation Works
Headwork	Sediments	Sediments filled the headwork; and only to the intake canal and sluice gate direction is free from sediments accumulation. The problem is in the design that is due to river flow direction; placing and type of sluice gate. And also discussion is made on the importance of clearing the sediments from the reservoir and provision of another sluice gate direct to the flow direction.	The sediments are already consolidated for seven years operation therefore it is stabilized. Thus on the efficiency of the weir body there is no impact as well as on the availability of water in the irrigation period.  In addition to that for the safety of the intake gate and hammering impact of the work the weir will be in risk if opening of another gate direct to the river flow direction is attempted. And also if the sluice gate is not operated as required the problem will be developed again. Thus it is decided to leave as it is.
	Left side wing wall extension, apron and cut off extension	The left side wing wall, apron and cut off were not constructed for the full length of the river cross section, thus the flow is passing through this week line.	Extending the wing wall, apron and cut off to the full length is proposed and sketch is attached in annex.
	Intake and sluice gate	The Intake and sluice are not provided with gate, therefore at the gate position farmers use sacks of sands for the regulating of the system.	Provision of steel gate is essential so as to provide good service in water management. (Sketch is attached in annex.)
Conveyance canal	0+065 - 1+080	The main canal, which passes through vertical cliff and big boulders canal route for the length of 0.35km, has no regular canal shape and slope. And also at most of the canal part it passes over suspend earth canal over the verge of the cliff, thus the farmers are looking carefully towards this problem.	Excavating the boulder rocks is hardly possible, by using different construction techniques and machineries and provision of lined canal is proposed
Distribution Canal	Secondary canals	At division Box No 1 the water is divided in to two directions, and the main is called secondary canal 1 and the second is used as a tertiary canal and/or field canal. Field structures were provided for secondary canal 1 only and most of the distribution is from this canal. In addition to that there are canals constructed from off takes of this canal, but they are not provided systematically to better water management. And also this major canal passes through the fences of the farmers, hence it is difficult to manage the water for efficient use.	Inspection is made towards secondary canal 1 and some of the so-called tertiary canals and according to the soil type, which is sandy; much of the water is lost through the distribution. Therefore lined canal is proposed for those canals, which diverted from Off-take No 1 and Off-take No 2 towards the right and left direction respectively.
		SC1:0+221-0+235 Canal is deteriorated.	Plastering
		SC1:0+287-0+424 Canal is deteriorated.	Plastering
		SC1:0+532-0+552 Canal is deteriorated.	Plastering
		SC1:3+557-3+688 Canal is deteriorated.	Plastering

**Table 6.4.3 Findings in Existing Facilities and Required Rehabilitation Works in Sadi Sadi and Lafa Schemes (2/3)**

Existing Facilities		Findings	Required Rehabilitation Works
Distribution Canal	Tertiary canals	TC1: 115m of length High percolation due to sandy soil and caving	Lined canal
		TC2: 330m of length High percolation due to sandy soil and caving	Lined canal
Field Structures	Off-takes (Turnouts)	The major problem of the Off-takes is lack of gate, and this creates a problem in water management. And also the supply of water to the field is directly from the secondary canal Off-take and the supply is rotational between the Off-takes. In addition to that cracks at the pipe out lets are observed.	Steel gates are proposed in each of the structures so as to provide fair water distribution between the users and to increase efficiency of the project. And as preventive measure to cracking it is recommended to chisel the cracked area and provide plastering.
	Culverts	The canals from the off-take crosses foot - path (field roads) and water loss is observed along these canals. Following to these roads and canals the land is eroded seriously, thus due attention is required for this case.	Provision of culverts at chainage 0+333, 0+432, and 0+768 at SC1
Access Road		The project is located at 10 km distance from Meti town and 21 km from Goljota town through very difficult dry weather road using four wheel drives In spite of this fact to reach the project the farmers are in problem to the supply of irrigation inputs and to access their product for market.	To change the life standard of the beneficiaries in this project and other four projects along this road (i.e. Goljota – Meti - Sadi Sadi) the accessibility of the road has to be improved.  Construction of access road from Goljota to Sadi Sadi is proposed and this road can serve about four irrigation projects to have the supply of irrigation inputs and to provide their products to market.

## 2. Lafa Scheme

Existing Facilities		Findings	Required Rehabilitation Works
Headworks	Right side wing wall extension	The down stream right bank of the headwork wing wall was closed to the abutment using earthen embankment, but now it is eroded therefore, currently it is not closed to the abutment. This resulted to flow over the weir and erodes the main canal.	Extension of the wing wall to the abutment using masonry is proposed so as to avoid the risk of biting the lined canal as well as the headwork structure.
	Sluice gate	The sluice gate, which uses to remove accumulated sediments behind the weir, is not functioning properly, because it hasn't be used since the project implementation till now. Therefore, sediments are filled behind the weir and sluice gate becomes out of order (deteriorated).	To provide the targeted uses of the component the sediments behind the weir body and sluice gate has to be removed and provision of grease and small maintenance has to be given for the gate.
Conveyance canal	Main canal	Even though the main canal, which runs for 126 m length, has not provided maintenance, there is no serious crack, except just at the intake out let. But the structure like the drop and energy dissipaters shows cracks at their floors.	Provide chiseling and apply plastering at the internal face of the structures. In addition to that provision of plastering to the whole main canal at the internal face is recommended.
Distribution Canal	Secondary canals	Parallel to the secondary canal there exists a footpath and flood passes through it and this resulted to erosion and exposing the lined canal to risk.	Filling the foot path to the required depth is recommended in addition to that pointing the external face of the canal makes the system more sustainable.
		Due to tearing of the existing lined canal there exists cracks at six to ten meter distance along the secondary canals.	Provide chiseling and apply plastering at the internal face of the Main and, Secondary canal.

**Table 6.4.3 Findings in Existing Facilities and Required Rehabilitation Works in Sadi Sadi and Lafa Schemes (3/3)**

Existing Facilities		Findings	Required Rehabilitation Works
Distribution Canal	Secondary canals	At the sharp end of the canal water is splashed above the canal top because of the radius curvature of the canal was not attain to the required height in the construction.	At the sharp bend locations increase the height of the lined canal.
	Tertiary canals	All canals passed through sandy clay soil, and aligned in steep slope topographic landforms. Therefore, the main and secondary canals are fully lined and the Tertiary canal, which is branched from the secondary canal 2/1, is earth. This canal is under risk due to the above cases and floods coming from the catchments.	To avoid the risk this tertiary canal is proposed to be lined, and to pass the catchments floods safely the existing culvert is modified to use as a cross drainage. And excavation of catch drains parallel to the tertiary canal is must.
Field Structures	Division box 1 at 0+127 and 2 at 0+230	The system is designed for proportional control; hence provision of gate was not considered. But the existing lay out is not as per the intended approach. In addition to that the floors of the division boxes are out of use, thus maintenance is must.	Gates are proposed and also, maintenance of the existing foundation and plastering of the internal face are considered.
	Off-takes (Turnouts)	The major problem of the Off takes is lack of gate, and this creates a problem in water management. In addition to that cracks at the pipe out lets are observed.	Steel gates are proposed in each of the structures so as to increase efficiency of the project and to avoid the observed water scarcity. And as preventive measure to cracking it is recommended to chisel the cracked area and provide plastering.
Field Structures	Off-takes (Turnouts)	The supply of water to the field is directly from the secondary canal off-take and the supply is rotational between the off-takes. Therefore the amount of water released for one irrigation interval is not as per the recommended rate for the specific topography and intended irrigation system (continuous flow). This created problem and can be seen from the amount of land eroded by the discharge from the out let.	Provisions of additional four off-takes are recommended at chainage of 0+491, 0+968 at SC 1 and 0+002, 0+336 at SC2.
	Drops	Since all canals are lined drops are few, and are in a good condition. But the joints between the upstream protection and vertical wall of the drop needs minor maintenance.	Chiseling widely around the cracked area and apply three coats of plaster is proposed.
	Culverts	Culverts are provided systematically in the project, but now the community changes their settlement from the previous places and this makes the requirement of additional culvert.	Provision of culverts at SC 2/2 and chainage 1+064.is recommended.
Drainage system		To this project every essential components of irrigation project were not incorporated as well as the system is not provided with any drainage system. In addition to that the topography allows to release the excess water through the natural drains.	Therefore the project is not sensitive to the provision of maintenance and/or construction of drainage system.
Access Road		The project is located at five km distance from Meti town and 21 km from Goljota town through very difficult dry weather road using four wheel drives In spite of this fact to reach the project the farmers are in problem to the supply of irrigation inputs and to access their product for market even if their food security is moderately reserved.	To change the life standard of the beneficiaries in this project and other four projects along this road (i.e.Goljota – Meti - Lafa) the accessibility of the road has to be improved.  Construction of access road from Goljota to Lafa is proposed and this road can serve about four irrigation projects to have the supply of irrigation inputs and to provide their products to market

**Table 6.5.1 Project Design Matrix : Rehabilitation of Existing Schemes (Program III)**

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<b>Overall Goal:</b> Family income in irrigation schemes is improved	Annual gross income of farmers household is increased.	Farmers' income survey	Marketing system of agricultural products is not changed drastically.
<b>Project Purpose:</b> Low irrigation performance of existing schemes is improved and schemes are managed in sustainable.	1. Irrigation efficiency (actually irrigated area / planed scheme area) is increased. 2. Water charge for O&M is properly collected.	1. Interview to WUA members using plot layout map. 2. Bank account and cash account	Marketing system of agricultural products is not changed drastically. Agriculture extension support is given to farmers by other agency.
<b>Outputs:</b> 1. Functioning of irrigation facilities is improved 2. Organization operational capability of WUA is improved. 3. Water management is carried out properly. 4. Operation and maintenance of irrigation facilities are carried out sufficiently by WUA 5. Monitoring system of OIDA and WUA are established 6. Accessibility to market is improved	1-1 Rehabilitation work is completed. 1-2 Water discharge is increased. 2-1 WUA member's list is prepared and updated. 2-2 WUA meeting is held periodically. 2-3 WUA chairman and board members are elected and, their responsibilities are properly carried out. 2-4 WUA accounting is managed fairly 3-1 Water distribution schedule is prepared and, scheduled water distribution is realized 3-2 Water conflicts among members is not reduced 4-1 Water use fee for O&M is collected and saved properly. 4-2 Maintenance of facilities is regularly carried out by WUA 5. Monitoring of WUA activities is done periodically and, result of monitoring is submitted to OIDA central office 6. No. of visiting of middle-mans is increased.	1-1 Completion report of rehabilitation and handing over document 1-2 Measurement of water discharge 2-1 WUA member's list 2-2 Record or minutes of WUA activity 2-3 Interview to WUA member 2-4 Accounting Record 3-1 Water distribution schedule 3-2 Interview to WUA member 4-1 Accounting record, Bank account 4-2 Observation of water volume 5. Monitoring report prepared by OIDA and WUA 6. Interview to WUA member	Abnormal weather is not happened in project site. Price of crop is not declined drastically.
<b>Activity</b> 1-1 Inventory survey of irrigation facilities 1-2 Participatory rehabilitation planning by PRA 1-3 Survey, design and preparation of construction plan 1-4 Procurement of material and equipment and, rehabilitation work 2-1 Problem analysis with WUA member 2-2 Preparation of member's list and cadastre map 2-3 Training of WUA management and accounting 2-4 Preparation or review of by-law 2-5 Land exchange and consolidation 2-6 Study Tour (Site Visit) 3-1 Review of regulation for water distribution 3-2 Training for water distribution 4-1 Establishment of O&M structure and regulation 4-2 Training for O&M 5-1 Establishment of monitoring system in OIDA 5-2 Implementation of monitoring 5-3 Organize workshop 6-1 Rehabilitation work of access road	<b>Input</b> <u>OIDA</u> 1. Assignment of staff 2. Provide land, office and other necessary facilities 3. Provide some equipment <u>WUA</u> 1. Participation in planning of implementation plan 2. Participation in construction work and monitoring activity 3. Partial burden of necessary equipment for construction <u>JICA Study Team</u> 1. Assignment of Expert 2. Provide equipment for construction and monitoring(Heavy Equipment and Vehicle) 3. Provide necessary equipment and materials for construction 4. Per diem for OIDA staff 5. Cost burden for training and workshop		Personnel of OIDA branch office and wareda office is not changed drastically.  Preconditions 1 Basic Policy of Oromia Province on Irrigation Development (Decentralization and Participatory Development) is sustained and financial, personnel and institutional support is provided by OIDA 2. Sustainable water source was captioned (at least two years continuously)

**Table 7.3.1 List of Existing Irrigation Schemes in Oromia Region (1/3)**

No.	Name of Scheme	Branch Office	Location		Water Sources	Intake Structure	Const. Year (Completed)	Command Area Development			Number of Beneficiaries			Facility Status/1	WUA Status/2	Approximate Rehabilitation Cost (Birr)	Rehabilitation Work <sup>3</sup> (as of June 2004)			Category/3
			Zone	District				Plan	Actual	%	Plan	Actual	%				Study	Construction	Fund	
1	Kawa	Central Branch	Arsi	Gedeb	River	Pump & Headworks	1985	200	20	10.0	500	80	16.0	D	C	377,700	Completed	Completed	Ethio-Italy	C
2	Meti Metana	Central Branch	Arsi	Munesa	River	Headworks	1993	40	30	76.0	160	140	87.5	B	C	31,300				B
3	Sadi Sadi	Central Branch	Arsi	Munesa	Spring	Headworks	1995	60	44	73.3	210	240	114.3	B	C	383,833	Completed	Completed	JICA	B
4	Arata Chufa	Central Branch	Arsi	Zuway Dugda	River	Headworks	1993	100	80	80.0	317	317	100.0	B	A	170,300				D
5	Shalad-01	Central Branch	Arsi	Tiyo	Spring	Headworks	1995	50	47	94.0	196	184	93.9	A	A	196,400				D
6	Shalad-02	Central Branch	Arsi	Tiyo	Spring	Headworks	1995	25	0	0.0	100	0	0.0	D	Not Active	119,626	Completed	Not start	IFAD	C
7	Bosha-01	Central Branch	Arsi	Tiyo	Spring	Headworks	1993	100	60	60.0	233	320	137.3	C	C	77,590	Completed	Under construction	NGO	C
8	Bosha-02	Central Branch	Arsi	Tiyo	Spring	Headworks	1994	60	35	58.3	220	140	63.6	C	C	41,968	Completed	Not start	IFAD	C
9	Shoba	Central Branch	Arsi	Munesa	Spring	Headworks	1993	100	60	60.0	279	270	96.8	C	C	126,907	Completed	Under construction	NGO	C
10	Gedamso-01	Central Branch	Arsi	Munesa	River	Headworks	1996	80	60	75.0	64	159	248.4	B	C		Completed	Completed	JICA	B
11	Gedamso-02	Central Branch	Arsi	Munesa	River	Headworks	1997	90	34	37.8	70	150	214.3	D	C	160,700	Completed	Completed	JICA	C
12	Lafa	Central Branch	Arsi	Munesa	River	Headworks	1997	80	36	45.0	50	145	290.0	C	C	90,000	Completed	Completed	JICA	C
13	Sole Bakekisa	Central Branch	Arsi	Tena	River	Headworks	1998	100	40	40.0	300	150	50.0	D	C	200,400				C
14	Delali Sambaru	Central Branch	Arsi	Munesa	River	Headworks	1993	60	40	66.7	160	164	102.5	B	B	101,980				D
15	Dagaga Sambaro	Central Branch	Arsi	Munesa	River	Headworks	1996	40	20	50.0	60	40	66.7	C	B	181,400				A
16	Katar-01	Central Branch	Arsi	Tiyo	River	Headworks	1987	100	115	115.0	276	285	103.3	A	A		Completed	Completed	JICA	D
17	Katar-02	Central Branch	Arsi	Tiyo	River	Headworks	1993	210	198	94.3	180	202	112.2	A	B	350,400	Completed	Completed	JICA	D
18	Katar-03	Central Branch	Arsi	Tiyo	River	Headworks	1992	90	125	138.9	114	205	179.8	A	A		Completed	Completed	JICA	D
19	Hasen Usman	Central Branch	Arsi	Tena	River	Headworks	1994	230	280	121.7	527	1,000	189.8	A	B	86,974	Completed	Not start	IFAD	D
20	Homba	Central Branch	Arsi	Merti	River	Headworks	-	100	10	10.0	400	40	10.0	D	C	193,400	Completed	Completed	Ethio-Italy	C
21	Teltele	Central Branch	North Shoa	Detre Libanes	Spring	Headworks	1996	90	145	161.0	418	220	52.6	A	C	103,000				B
22	Lami	Central Branch	North Shoa	Yaya Gulale	Spring	Headworks	1996	30	56	187.3	200	225	112.5	A	B	88,395				D
23	Indris	Central Branch	West Shoa	Ambo	River	Headworks	1993	175	380	217.1	875	1,087	124.2	A	B	301,000				D
24	Laku	Central Branch	West Shoa	Bako-Tibe	River	Headworks	1994	50	6	12.0	40	9	22.5	D	D	200,000				C
25	Walga	Central Branch	West Shoa	Wanchi & Waliso	River	Headworks	1998	150	518	345.0	637	1,070	168.0	A	B	201,600				D
26	Walshamo	Central Branch	West Shoa	Chaliya	River	Headworks	1995	50	0	0.0	160	0	0.0	D	D	110,900				C
27	Robi	Central Branch	West Shoa	Meta Robi	River	Headworks	1998	120	123	102.5	410	410	100.0	A	C	206,400				B
28	Chole	Central Branch	West Shoa	Ambo	River	Headworks	1996	100	200	200.0	464	500	107.8	A	B	28,300				D
29	Lugo	Central Branch	East Shoa	Fentale	River	Headworks	1996	57	53	93.0	70	64	91.4	A	B	87,700				D
30	Sogido Bandira-01,02	Central Branch	East Shoa	Fentale	River	Headworks	1998	140	110	78.6	117	65	55.6	B	C	240,800				B
31	Godino	Central Branch	East Shoa	Adama	River	Dam	1996	219	183	83.6	270	182	67.4	A	C	376,680				B
32	Balbala	Central Branch	East Shoa	Adama	River	Dam	1996	100	42	42.0	400	182	45.5	C	C	85,600				C
33	Fultino	Central Branch	East Shoa	Adama	River	Dam	1998	85	33	38.8	182	165	90.7	D	C	70,000				C
34	Lafu	Central Branch	East Shoa	Shashamene	River	Headworks	1996	30	3	8.3	60	14	23.3	D	D	3,100				C
35	Kararo Arsi	Central Branch	East Shoa	Arsi Negele	River	Headworks	1990	42	38	90.5	253	85	33.6	A	B	72,240				D
36	Tiliku Debeda	Central Branch	East Shoa	Arsi Negele	River	Headworks	1995	50	25	50.8	200	101	50.5	C	D	3,100				C

Note : /1 Evaluation of facility status, A-D (Functioning - deteriorated)

/2 Evaluation of WUA, A-D (Very active - poor)

/3 Category A : Deterioration of facilities, B : Weak WUA, C : A+B, D : Relatively well Functioning

**Table 7.3.1 List of Existing Irrigation Schemes in Oromia Region (2/3)**

No.	Name of Scheme	Branch Office	Location		Water Sources	Intake Structure	Const. Year (Completed)	Command Area Development			Number of Beneficiaries			Facility Status/1	WUA Status/2	Approximate Rehabilitation Cost (Birr)	Rehabilitation Works(as of June 2004)			Category/3
			Zone	District				Plan	Actual	%	Plan	Actual	%				Study	Construction	Fund	
37	Meki-Zway	Central Branch	East Shoa	Duguda Bora	Lake	Pump	1984	1,500	216	14.4	3,375	332	9.8	D	D	197,600				C
38	Kujur	Western Branch	West Walaga	Najo	River	Headworks	1998	57	0	0.0	110	0	0.0	D	D	80,370	Completed	Under construction	UNDP	C
39	Borta	Western Branch	West Walaga	Savo	River	Headworks	1996	40	7	17.5	120	31	25.8	D	D	68,800				C
40	Bondo	Western Branch	West Walaga	Savo	River	Headworks	1995	50	8	16.0	150	25	16.7	D	D	86,000				C
41	Degaro	Western Branch	West Walaga	Nadijo	River	Headworks	1997	120	28	23.3	296	120	40.5	D	D	206,400				C
42	Gi'I	Western Branch	West Walaga	Gimbi	River	Headworks	1996	60	8	12.5	228	26	11.4	D	D	103,200				C
43	Sokoru	Western Branch	West Walaga	Rharasibu	River	Headworks	1997	30	25	83.3	267	37	13.9	A	C	51,600				B
44	Waja	Western Branch	East Walaga	Limu	River	Headworks	1996	25	25	99.0	200	198	99.0	A	D	61,199	Completed	Completed	UNDP	B
45	Dhangago-01	Western Branch	East Walaga	Jima-Rare	River	Headworks	1995	30	21	71.3	253	129	51.0	B	C	51,600				B
46	Jato-01	Western Branch	East Walaga	Jima-Rare	River	Headworks	1994	54	46	85.0	515	419	81.4	A	D	92,880				B
47	Gambela Tare	Western Branch	East Walaga	Guto-Wayu	River	Headworks	1994	150	59	39.2	235	86	36.6	D	D	258,000				C
48	Negeso	Western Branch	East Walaga	Bila-Sayo	River	Headworks	1997	30	30	100.0	128	160	125.0	A	B	5,352				D
49	Abono-02	Western Branch	East Walaga	Jima-Arjo	River	Headworks	1995	80	67	83.1	248	160	64.5	A	B	197,482	Completed	Completed	UNDP	D
50	Tate	Western Branch	East Walaga	Leka-Dalacha	River	Headworks	1993	20	0	0.0	75	0	0.0	D	In Active	34,400				C
51	Jato-02	Western Branch	East Walaga	Guto-Wayu	River	Headworks	1997	60	0	0.0	157	0	0.0	D	D	40,236				C
52	Dhangago-02	Western Branch	East Walaga	Guto-Wayu	River	Headworks	1997	20	0	0.0	162	0	0.0	D	D	34,400				C
53	Gibe Lamu-01	Western Branch	East Walaga	Jima-Rare	River	Headworks	1995	53	53	100.0	250	54	21.6	A	B	91,160				D
54	Gibe Lamu-02	Western Branch	East Walaga	Bila-Sayo	River	Headworks	1996	60	23	39.0	250	37	14.8	D	D	103,200				C
55	Jare	Western Branch	East Walaga	Bila-Sayo	River	Headworks	1998	40	0	0.0	112	0	0.0	D	In Active	68,800				C
56	Koba Guda	Western Branch	Ilu Aba Bora	Gachi-Boracho	River	Headworks	1996	56	0	0.0	57	0	0.0	D	In Active	90,005	No	No	UNDP	C
57	Nada Guda	Western Branch	Jima	Omo-Nada	River	Headworks	1997	120	31	25.8	340	48	14.1	D	D	206,400				C
58	Kawa	Western Branch	Jima	Dedo	River	Headworks	1997	120	54	45.0	270	54	20.0	C	D	206,400				C
59	Birbira	Western Branch	Jima	Oarsa	River	Headworks	1997	70	5	7.4	150	52	34.7	D	D	120,400				C
60	Abono	Western Branch	Jima	Savo Chokorsa	River	Headworks	1994	160	0	0.0	300	0	0.0	D	In Active	275,200				C
61	Waro	Western Branch	Jima	Dedo	River	Headworks	1996	180	25	13.9	300	40	13.3	D	D	309,600				C
62	Arara-01	Eastern Branch	East Harar	Kersa	Spring	Headworks	1994	40	50	125.0	276	276	100.0	A	B	68,800				D
63	Arara-02	Eastern Branch	East Harar	Kersa	Spring	Headworks	1994	25	25	100.0	100	100	100.0	A	B	43,000				D
64	Babi Ali	Eastern Branch	East Harar	Deder	Spring	Headworks	1994	46	60	130.4	130	220	169.2	A	B	79,120				D
65	Burka Deneba	Eastern Branch	East Harar	Gurawa	Spring	Headworks	1997	76	76	100.0	215	216	100.5	A	B	39,412	Completed	Under construction	UNDP	D
66	Chulul	Eastern Branch	East Harar	Goro Gutu	Spring	Headworks	1996	75	64	85.6	275	256	93.1	A	C	129,000				B
67	Erer Meda Talila	Eastern Branch	East Harar	Deder	Spring	Headworks	1995	100	100	100.0	550	550	100.0	A	B	172,000				D
68	Galan Sadi	Eastern Branch	East Harar	Melka Balo	Spring	Headworks	1995	100	100	100.0	360	360	100.0	A	B	35,470	Completed	Not start	IFAD	D
69	Jarjartu	Eastern Branch	East Harar	Gurawa	River	Headworks	1996	60	36	60.0	240	240	100.0	C	B	79,981	Completed	Completed	FAO	A
70	Mudana Silo	Eastern Branch	East Harar	Gurawa	Spring	Headworks	1998	51	56	109.8	120	175	145.8	A	B	34,341	Completed	Not start	UNDP	D
71	Melba	Eastern Branch	East Harar	Meta	Spring	Headworks	1998	51	44	85.6	107	107	100.0	A	B	87,720				D
72	Ramis	Eastern Branch	East Harar	Gurawa	River	Headworks	1996	60	51	85.0	273	273	100.0	A	B	54,590	Completed	Not start	IFAD	D
73	Burka Burbursa	Eastern Branch	East Harar	Deder	Spring	Headworks	1995	40	0	0.0	100	0	0.0	D	In Active	68,800				C

Note : /1 Evaluation of facility status, A-D (Functioning - deteriorated)

/2 Evaluation of WUA, A-D (Very active - poor)

/3 Category A : Deterioration of facilities, B : Weak WUA, C : A+B, D : Relatively well Functioning

**Table 7.3.1 List of Existing Irrigation Schemes in Oromia Region (3/3)**

No.	Name of Scheme	Branch Office	Location		Water Sources	Intake Structure	Const. Year (Completed)	Command Area Development			Number of Beneficiaries			Facility Status/1	WUA Status/2	Approximate Rehabilitation Cost (Bir)	Rehabilitation Work(s) as of June 2004			Category/3				
			Zone	District				Plan	Actual	%	Plan	Actual	%				Study	Construction	Fund					
74	Said Ali	Eastern Branch	East Harar	Kersa	Spring	Headworks	1994	46	71	154.3	160	270	168.8	A	B	79,120				D				
75	Water-01	Eastern Branch	East Harar	Kersa	Spring	Headworks	1993	60	60	100.0	130	130	100.0	A	B	103,200				D				
76	Water-02	Eastern Branch	East Harar	Kersa	Spring	Headworks	1994	71	60	84.5	150	150	100.0	A	B	122,120				D				
77	Water-03	Eastern Branch	East Harar	Kersa	River	Headworks	1995	40	40	100.0	260	260	100.0	A	B	68,800				D				
78	Harewo	Eastern Branch	East Harar	Meta	Spring	Headworks	1995	40	15	37.5	133	60	45.1	D	B	68,800				A				
79	Amir Nur Decho	Eastern Branch	West Harar	Tulo	Spring	Headworks	1994	40	17	42.5	80	28	35.0	C	B	68,800				A				
80	Chafe Gurati	Eastern Branch	West Harar	Tulo	River	Headworks	1995	60	35	57.9	86	139	161.6	C	B	62,779	Completed	Under construction	FAO	A				
81	Hirna	Eastern Branch	West Harar	Tulo	River	Headworks	1994	70	40	57.1	80	63	78.8	C	C	120,400				C				
82	Homicho	Eastern Branch	West Harar	Bedesa	River	Headworks	1991	375	212	56.5	600	200	33.3	C	D	645,000				C				
83	Kasheja	Eastern Branch	West Harar	Chiro	River	Headworks	1992	187	139	74.3	748	556	74.3	B	D	321,640				B				
84	Midhagudu	Eastern Branch	West Harar	Tulo	River	Headworks	1997	235	105	44.8	250	53	21.2	C	D	18,444	Completed	Under construction	FAO	C				
85	Haya Oda	Southern Branch	Bale	Mana Angetu	River	Headworks	1995	100	96	96.0	220	178	80.9	A	B	172,000				D				
86	Hora Boka	Southern Branch	Bale	Sinana Dinsho	River	Free Intake	1983	32	0	0.0	183	0	0.0	D	In Active	55,040				C				
87	Gomgoma	Southern Branch	Bale	Mana Angetu	River	Headworks	1994	71	51	71.8	156	182	116.7	B	C	216,090	Completed	Under construction	UNDP	B				
88	Chiri	Southern Branch	Bale	Mana Angetu	River	Headworks	1994	50	50	100.0	140	152	108.6	A	B	86,000				D				
89	Dinki	Southern Branch	Bale	Ginir	River	Headworks	1997	200	169	84.4	450	265	58.9	A	B	116,116	Completed	Not start	IFAD	D				
90	Melko Buta	Southern Branch	Bale	Goro	River	Headworks	1984	85	0	0.0	340	0	0.0	D	In Active	146,200				C				
91	Shaya	Southern Branch	Bale	Sinana Dinsho	River	Headworks	1987	230	0	0.0	271	0	0.0	D	In Active	395,600				C				
92	Ukuma	Southern Branch	Bale	Dodola	River	Headworks	1997	100	0	0.0	400	0	0.0	D	In Active	172,000				C				
93	Arada Tare	Southern Branch	Bale	Ginir	River	Headworks	1996	120	120	100.0	288	300	104.2	A	B	206,400				D				
94	Oda-Roba	Southern Branch	Bale	Ginir	River	Headworks	1997	70	70	100.0	120	200	166.7	A	B	229,555	Completed	Not start	IFAD	D				
95	Melka Hida	Southern Branch	Borana	Galana-Abaya	River	Headworks	1998	70	0	0.0	136	0	0.0	D	In Active	120,400				C				
96	Abeda Chambe	Southern Branch	Borana	Adola	River	Headworks	1996	60	0	0.0	200	0	0.0	D	In Active	103,200				C				
<b>Total</b>								9,724	5,991	61.6	26,047	16,577	63.6				12,700,315					A 5		
<b>Average</b>								101	62	-	271	173	-										B 14	
<b>Maximum</b>								1,500	518	-	3,375	1,087	-										C 43	
<b>Minimum</b>								20	0	-	40	0	-											D 34

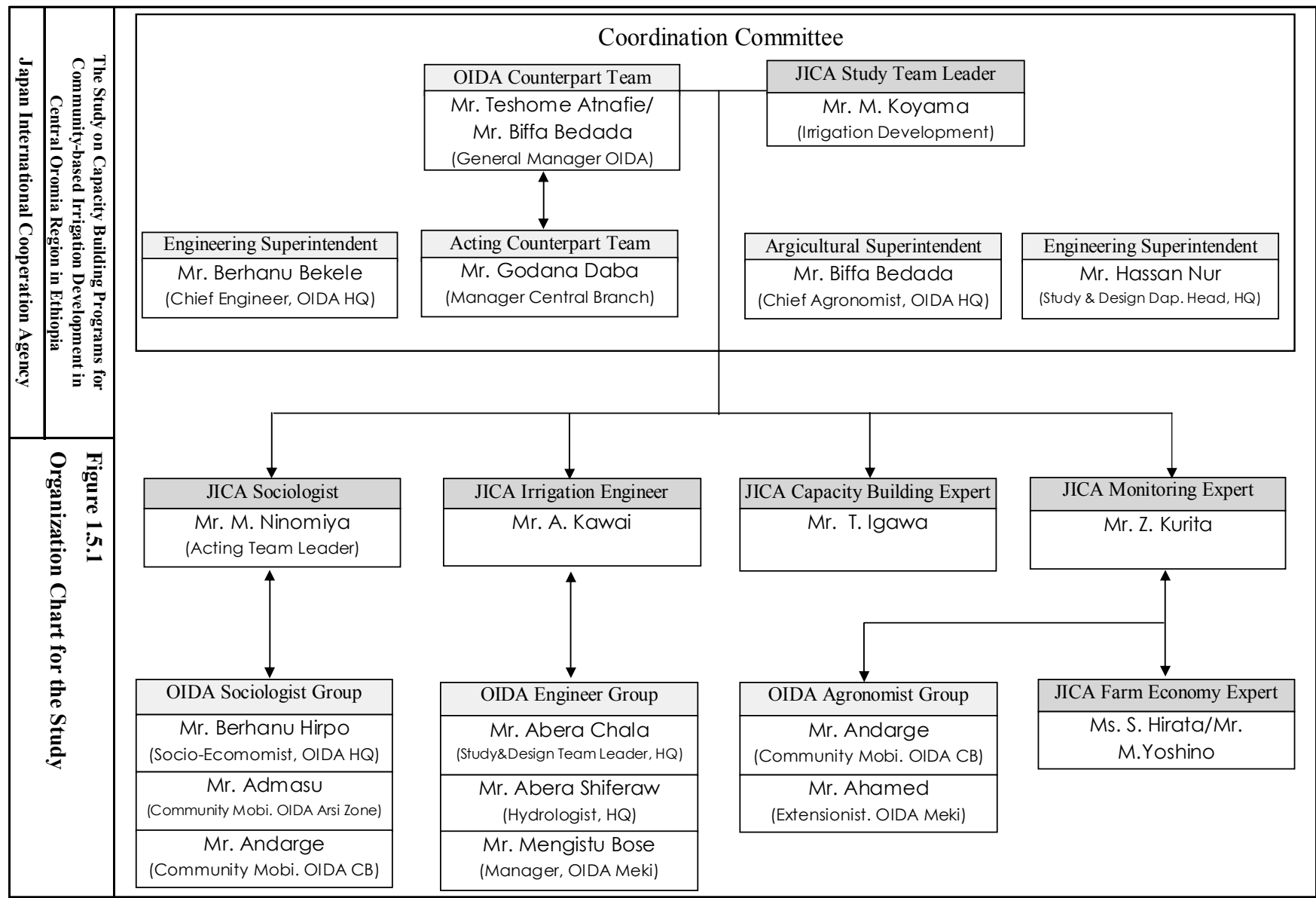
Note : /1 Evaluation of facility status, A-D (Functioning - deteriorated)

/2 Evaluation of WUA, A-D (Very active - poor)

/3 Category A : Deterioration of facilities, B : Weak WUA, C : A+B, D : Relatively well Functioning

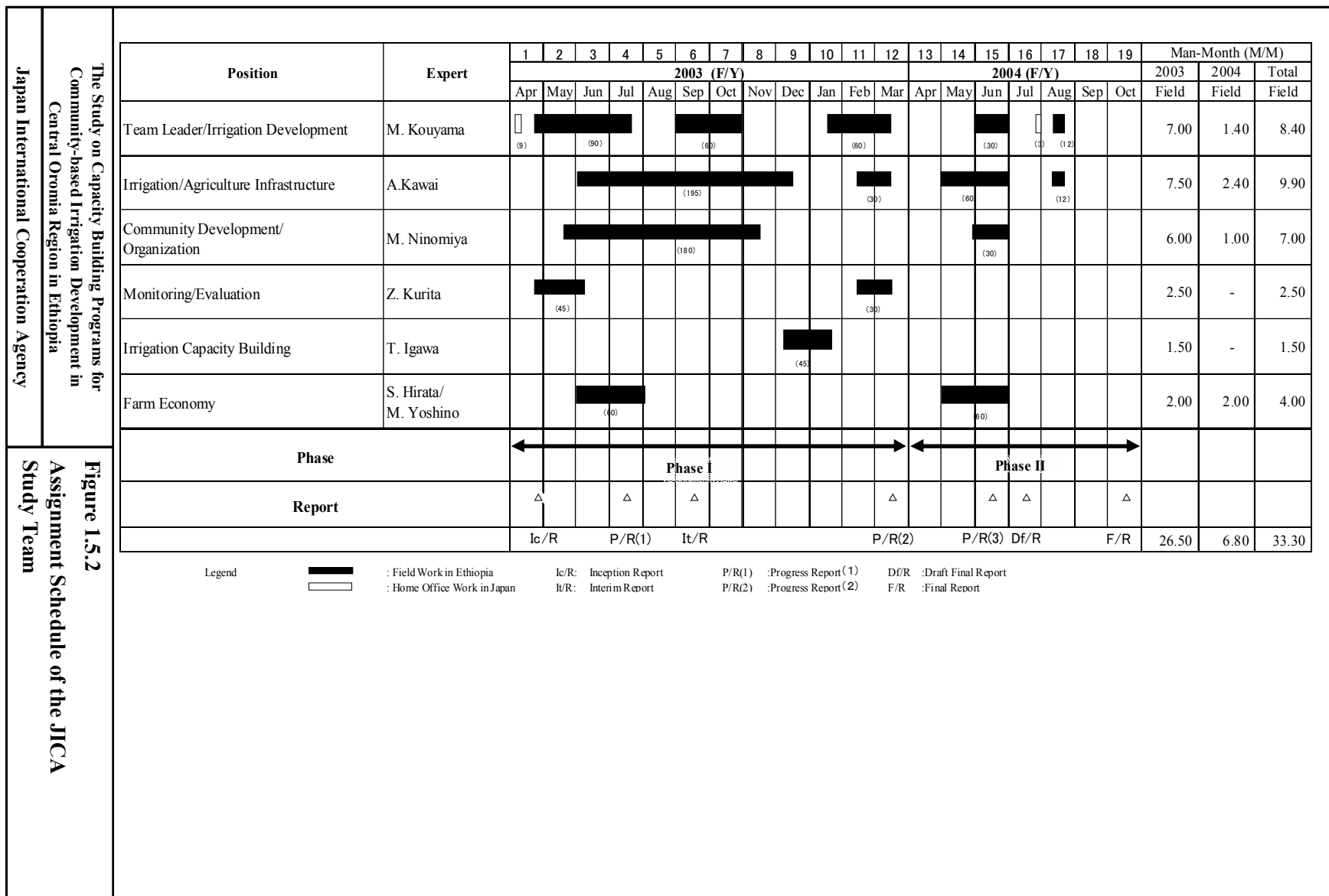


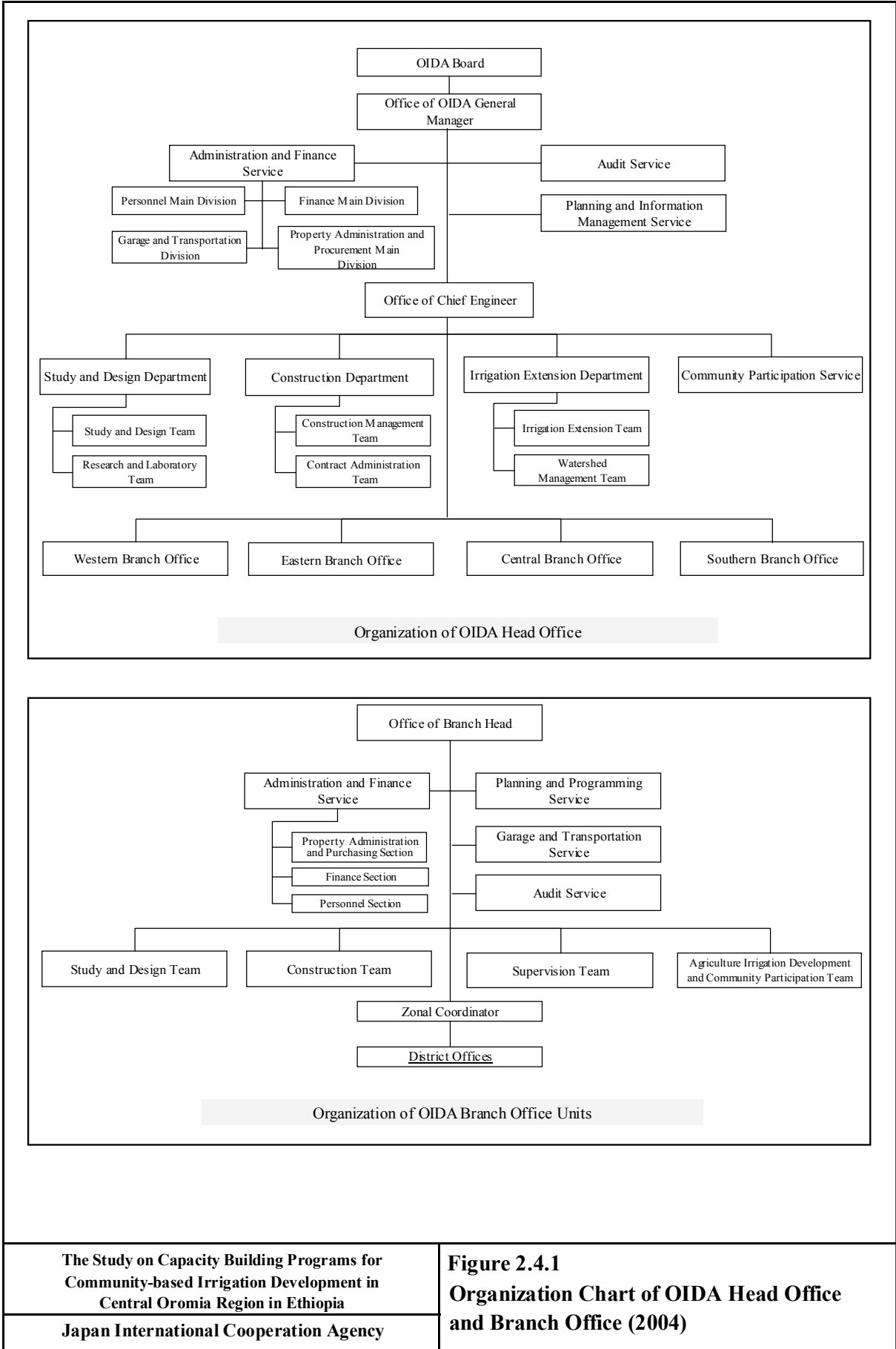
## Figures



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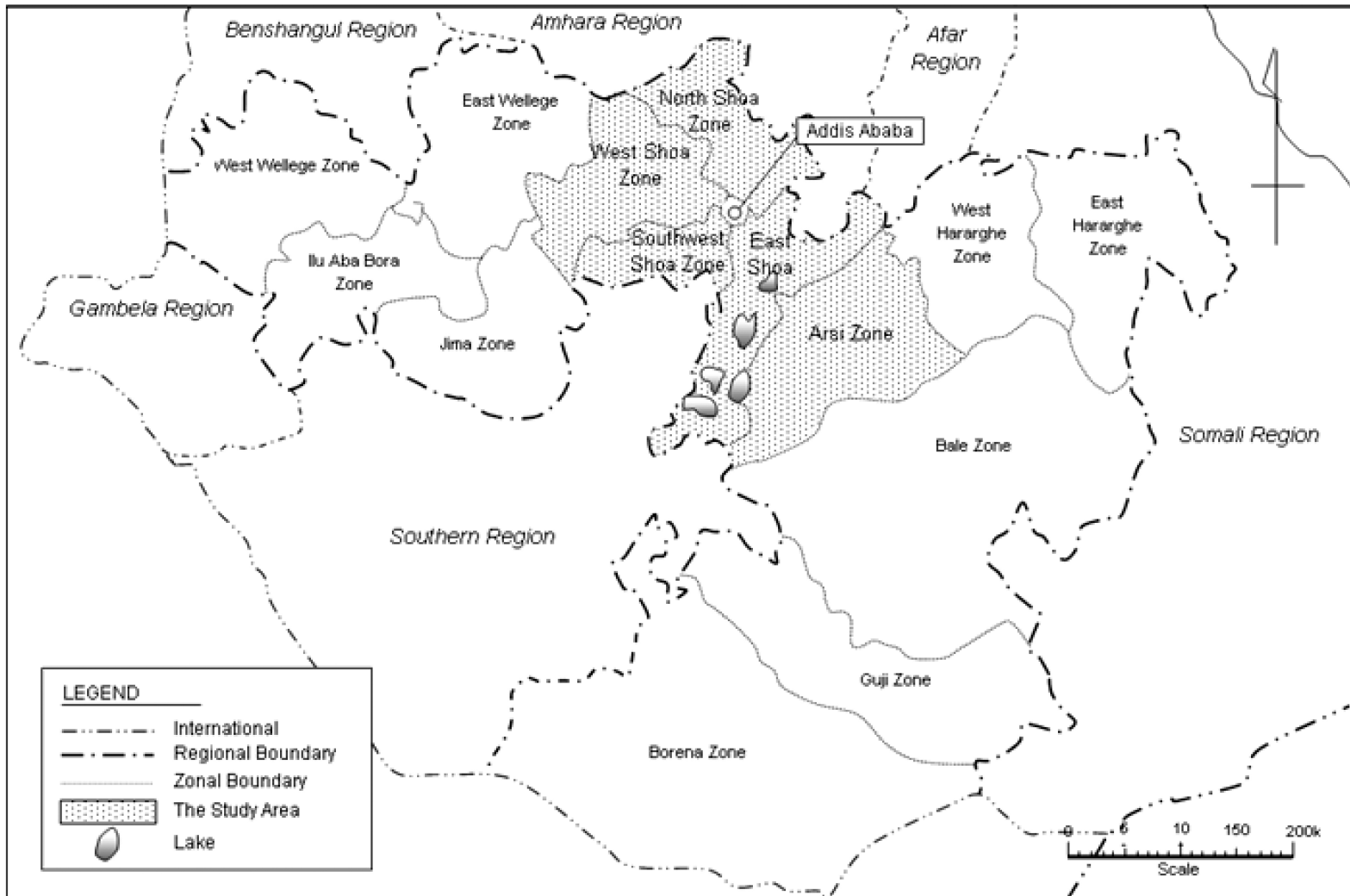
**Figure 1.5.1**  
**Organization Chart for the Study**

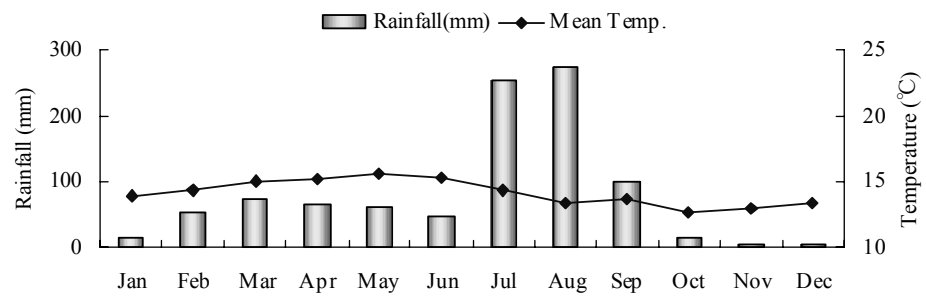




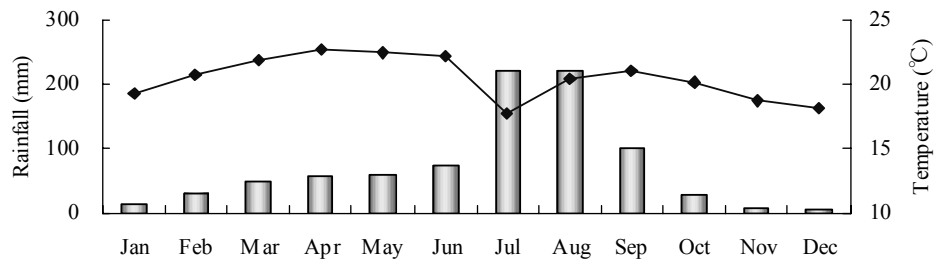
**Figure 2.4.1**  
**Organization Chart of OIDA Head Office**  
**and Branch Office (2004)**

Figure 3.1.1  
Location Map of Oromia Region and  
the Study Area

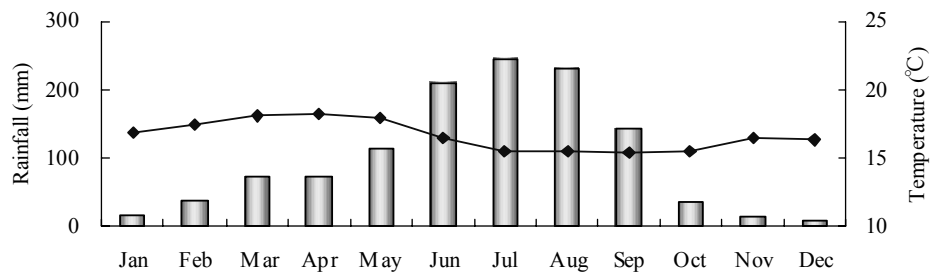




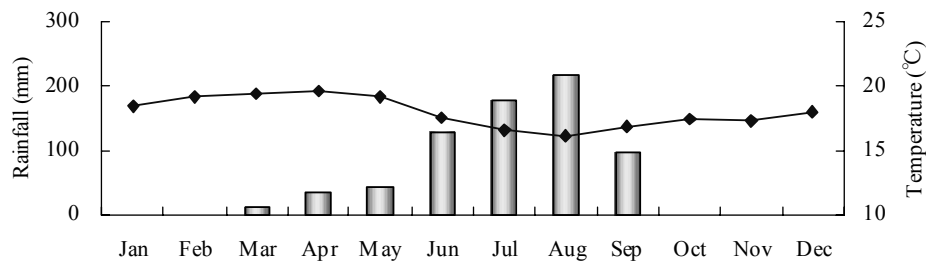
Fiche, North Shoa Zone, Altitude 2,750m



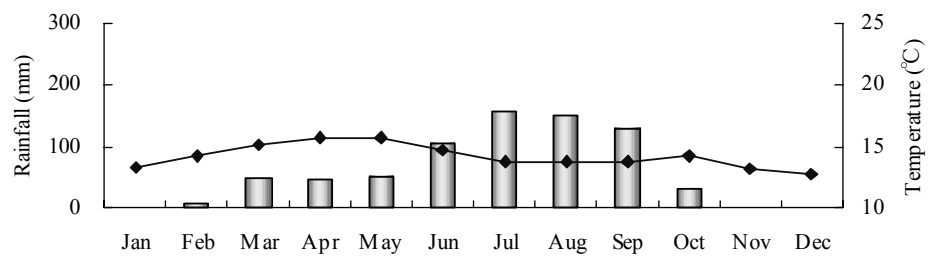
Adama, East Shoa Zone, Altitude 1,648m



Ambo, West Shoa Zone, Altitude 2,130m



Woliso, Southwest Shoa Zone, Altitude 1,960m



Asela, Arsi Zone, Altitude 2,370m

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**Figure 3.2.1**  
**Mean Monthly Rainfall and Temperature**  
**of Five Zones of the Study Area**

No.	Scheme	Branch	Zone	District	Command area(ha)	Beneficiaries (HH)	Fund	Cost (Birr)	2003			2004						Rehabilitation Progress As of June 2004	
									Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.		Jul.
1	Kawa	Central	Arsi	Gedeb	200	500	Ethio-Italy	N.A	(Completed before October 2003)									100%	
2	Ketar-01	Central	Arsi	Tiyo	110	276	JICA	350,400	██████████										100%
3	Ketar-02	Central	Arsi	Tiyo	200	180	JICA		██████████										100%
4	Ketar-03	Central	Arsi	Tiyo	90	114	JICA		██████████										100%
5	Gedamso-01	Central	Arsi	Munesa	80	60	JICA	160,700	██████████			██████████							100%
6	Gedamso-02	Central	Arsi	Munesa	90	34	JICA		██████████			██████████							100%
7	Sadi Sadi	Central	Arsi	Munesa	60	240	JICA	473,833				██████████							100%
8	Lafa	Central	Arsi	Munesa	80	140	JICA					██████████							100%
9	Bosha-01	Central	Arsi	Tiyo	60	233	NGO	77,590									░░░░░░░░	N.A.	
10	Bosha-02	Central	Arsi	Tiyo	100	220	IFAD	41,968									░░░░░░░░	0%	
11	Shoba	Central	Arsi	Munesa	120	440	NGO	126,907									░░░░░░░░	N.A.	
12	Hassen Husmaan	Central	Arsi	Xichoo	230	317	IFAD	86,974									░░░░░░░░	0%	
13	Sheld-02	Central	Arsi	Ziway Dugda	30	100	IFAD	119,626									░░░░░░░░	0%	
14	Homba	Central	Arsi	Merti	100	400	Ethio-Italy	N.A	(Completed before October 2003)									100%	
15	Kujur	Western	W/Wollega	Nedjo	57	110	UNDP	80,370									░░░░░░░░	N.A.	
16	Abono-02	Western	E/Wollega	Diga Leeka	80	248	UNDP	197,482				██████████							100%
17	Koba Guda	Western	I/A/Boora	Gachi	56	210	UNDP	-									░░░░░░░░	0%	
18	Waja	Western	E/Wollega	Gida Kiramu	60	130	UNDP	61,199				██████████							100%
19	Mudanu Sailo	Eastern	E/Hararghe	Girawa	46	160	UNDP	34,341									░░░░░░░░	0%	
20	Galan Sadii	Eastern	E/Hararghe	Dadar	100	360	IFAD	35,470									░░░░░░░░	0%	
21	Ramisi	Eastern	E/Hararghe	Calanqoo	60	273	IFAD	54,590									░░░░░░░░	0%	
22	Burqaa Danaba	Eastern	E/Hararghe	Girawa	76	215	UNDP	39,412									░░░░░░░░	N.A.	
23	Chafee Guraatti	Eastern	W/Hararghe	Tulloo	100	220	FAO	62,779									░░░░░░░░	N.A.	
24	Midhagduu	Eastern	W/Hararghe	Baddessa	200	250	FAO	18,444									░░░░░░░░	N.A.	
25	Jarjartuu	Eastern	E/Hararghe	Malka Balo	60	240	FAO	79,981				██████████						100%	
26	Oda Roba	Southern	Bale	Ginir	70	150	IFAD	229,555									░░░░░░░░	0%	
27	Dinik	Southern	Bale	Ginir	200	450	IFAD	116,116									░░░░░░░░	0%	
28	Gomgoma	Southern	Bale	Mana Angentu	70	213	UNDP	216,090									░░░░░░░░	N.A.	
<b>Total</b>					<b>2,785</b>	<b>6,483</b>													

██████████ :Completed    ░░░░░░░░ :Under Rehabilitation    □□□□ :Planned to be Rehabilitated