Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Federal Democratic Republic of Ethiopia

Ex-Post Evaluation of Japanese Technical Cooperation Project

"Project for Irrigation Farming Improvement"

External Evaluator: Riai Yamashita, JIN Cooperation

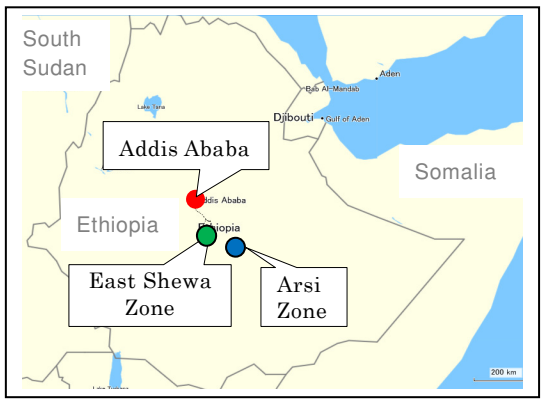
0. Summary

The project has helped improve water utilization technology in the target area in Ethiopia, where the people were dependent on traditional farming technology and rain-fed agriculture.

To summarize the evaluation results, the project was highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance was high. Its effectiveness was also high, since the project outputs and objective were achieved. Despite concern that the level of groundwater would decline in areas where the massive introduction of small-scale pumps was encouraged, several positive impacts have been identified such as the diversification of crops and increase in double or triple cropping, including the dry season. As far as the project inputs are concerned, the schedule for the dispatch of Japanese experts should have been improved following the activity on the ground. In addition, the shortage and frequent turnover of counterpart personnel adversely affected the activity schedule. However, in general, its efficiency was high since the project cost and cooperation period were as planned. Its sustainability was also fair, because the irrigation farming was continued by the Water Users' Cooperatives (WUC) and farmers, despite concern over the sustainability of the implementation structure due to the possibility of structural reform of the government.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



(Project Locations)

(Gravity force irrigation at Ketar II)

1.1 Background

In Ethiopia, 85% of the population is engaged in agriculture, and agricultural production accounts for more than 50% of its GDP[1]. Agriculture is thus crucial to its economy and industry. The Agriculture Development-Led Industrialization (ALDI) strategy has been promoted under the Sustainable Development and Poverty Reduction Program (SDPRP), which started in 2002.

Conversely, the country has been suffering from food shortages caused by droughts since late 2002, which imposed a dreadfully adverse effect upon its economy and industry. The government of Ethiopia considered the issue of ensuring food security its top priority and has been striving to increase agricultural productivity and diversification. However, it lacked both human resources and capacity to translate such efforts into specific measures.

Under such circumstances, JICA conducted a study on Meki Irrigation and Rural Development (September 2000-January 2002) and formulated a master plan for agricultural and rural development, focusing on irrigation development. Furthermore, JICA dispatched a fact-finding study team on agricultural development twice in March and August 2002, and proposed the necessity of its cooperation for (1) the development of agricultural research and a dissemination system and (2) the development of small-scale irrigation systems.

Against the above backdrop, JICA implemented a study on Capacity Building Programs for Community-based Irrigation Development in the Central Oromia Region (April 2003-October 2004). It was confirmed that the participatory approach would be effective for planning, construction / rehabilitation work, human resource development and the organizing of a Water Users' Association (WUA). In response to the results, the government of Ethiopia concluded that the further dissemination and promotion of small-scale irrigation agriculture would significantly help increase agricultural productivity and ease food insecurity. The government of Ethiopia requested that the government of Japan further implement a technical cooperation project. Subsequently, the Project for Irrigation Farming Improvement was started in September 2005.

1.2 Project Outline

Overall Goal		The agricultural production in the project target area is increased.
Project Objective		Water utilization technology is improved by the farmers in the project target area.
Output(s)	Output 1	Rehabilitation of existing irrigation schemes (gravity force) is

[1] Central Statistical Agency, 2000/2001

		standardized.
	Output 2	Management of small scale irrigation scheme (pump) is improved.
	Output 3	Water harvesting technology for agriculture is standardized.
	Output 4	Irrigation farming technology is improved.
Inputs		Japanese Side: 1. Experts 21 in total 4 long-term, 17 short-term 2. 9 trainees received (9 for Counterpart training in Japan) 3. 3 trainees for Third-Country Training Programs (Morocco) 4. Equipment 25,010,000 yen 5. Local Cost 38,350,000 yen 6. Others (inc. dispatch of related missions) Progress Review Mission in March, 2007 Ethiopian Side: 1. 39 counterparts in total 2. No financial support. 3. Land and Facilities, Project Office, Utilities 4. Local Cost, Counterpart Salary, Seminars
Total cost		295,835,000 yen
Period of Cooperation		September 2005-September 2008
Implementing Agency		OARDB: Oromia Agriculture and Rural Development Bureau (September-December, 2005) OIDA: Oromia Irrigation Development Authority (December 2005-January 2008) OWRB: Oromia Water Resource Bureau (January 2008-September 2008) OWMEB: Oromia Water, Mineral and Energy Bureau (After the project termination)
Cooperation Agency in Japan		Ministry of Agriculture, Forestry and Fisheries
Related Projects (if any)		The Study on Meki Irrigation and Rural Development in Oromia Region (September 2000-January 2002) The study on capacity building programs for community-based irrigation development in central Oromia Region (April 2003-October 2004)

	The Project for Capacity Building in Irrigation Development (June 2004-May 2014: ongoing)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Overall Goal

The overall goal of the project was not evaluated due to the difficulty in collecting data on the surrounding area. However, interviews with farmers in the project area and the results of the questionnaires to counterparts revealed that most farmers in the project area could harvest twice or three times a year, including dry season. Adverse impacts included the concern that the level of underground water would decline in future. It was also pointed out that farmers who lived downstream of the irrigated area might suffer from water shortage, hence water management problems were possible among WUC/WUA.

1.3.2 Achievement of Project Objective

Achievements of the project objective were confirmed with its three indicators, (1) the guideline authorization by OWRB, (2) understanding of the guideline by OWRB staff, (3) application of the guideline to other projects implemented by OWRB after April 2008. All three indicators were expected to be achieved upon project completion.

1.3.3 Recommendations

1) Short-term issues: before the project completion

The guidelines should be finalized, authorized and printed by the end of August 2008. Subsequently, a workshop should be held to introduce the guidelines. Regarding the survey on spate irrigation, further problem analysis should be held. Experiments on useful water-saving technology should be performed during rainy season.

2) Medium- and long-term issues: upon completion of the Project

To adapt and disseminate the guidelines to all stakeholders, OWRB should have responsibility as the executive body. It is essential for OWRB to stabilize its budget and staff allocation for irrigation development. A monitoring system should be established in the project area, and regular monitoring activities and meetings should be conducted. Also, it would be better to provide support to maintain and renovate the irrigation systems through WUC/WUA's funds. Continuous training programs for WUC/WUA and farmers should be organized by OWRB in collaboration with the Oromia Bureau of Agriculture and Rural Development (OBARD). To secure water resources and prevent conflicts relating to water distribution, it is necessary to survey and prepare a water management master plan and establish a legal system for water distribution.

2. Outline of the Evaluation Study

2.1 External Evaluator

Riai Yamashita, JIN Cooperation

2.2 Duration of Evaluation Study

Duration of the Study: November 20, 2011-July 31, 2012

Duration of the Field Study: January 15-February 3, 2012, May 27-June 2, 2012

2.3 Constraints during the Evaluation Study

During the field study, only twelve of a total thirty-nine counterparts continued to work at OWMEB. There has been frequent transfer of staff due to the structural reform of the implementing agency as part of the Business Process and Re-engineering (BPR). In addition, only six counterparts engaged in the project from beginning to end, hence some questions could not be answered by any staff and some data could not be collected.

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance with the Development Plan of Ethiopia

When the project was planned, the government of Ethiopia had implemented the Second Five-Year National Development Plan (2000-2005) which promoted the agricultural extension program. This program aimed to increase agricultural productivity and production as well as improving agricultural technology and development.

At the end of the project period, the Third Five-Year National Development Plan (2006 -2010) had been implemented. One of the strategies of the plan was to accelerate agricultural development and ensure food security to reduce poverty through economic development. In addition, the plan emphasized support for small-scale irrigation and water harvesting technology (WHT) as a means of increasing agricultural production and food security.

Furthermore, the Water Sector Development Program (WSDP) was formulated in 2002 by the Ministry of Water Resources (MoWR), which promoted the Irrigation Development Program. In the program, the development of small-scale irrigation and capacity development of government staff were prioritized. Also, as shown in Table 1, the WSDP has promoted small-scale irrigation over the program period (2002-2016). Conversely, it promoted medium- and large-scale irrigation in the medium and long terms.

---

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[3] ③: High, ② Fair, ① Low

Table 1: Planned Area for Irrigation Development and Number of Projects in WSDP

	Small-Scale Irrigation		Medium- and Large-Scale Irrigation	
	Newly Developed Area (ha)	No. of projects	Newly Developed Area (ha)	No. of projects
Short-Term (2002-2006)	40,319	546	13,044	2
Medium-Term (2007- 2011)	40,348	511	39,701	6
Long-Term (2012-2016)	46,471	549	94,729	9

Source: Water Sector Development Program (2002–2016)

Therefore, the assistance for small-scale irrigation under the project, including gravity-forced irrigation, small-scale pump irrigation and WHT was consistent with the development plans of the country.

3.1.2 Relevance with the Development Needs of Ethiopia

When the project started, Oromia was the biggest region in the country, where 80% of the population lived in rural areas engaging in traditional and rain-fed agriculture. The region faced problems of low agricultural production and productivity, which led to low food security. This was caused by unstable rainfall, soil erosion in hilly areas during the rainy season as well as the low development of local markets. In addition, the region had an actual irrigated area covering only 12% (206,337ha) of the huge potential area of 1.7 million ha, which means the people were unable to utilize abundant water resources. Accordingly, food security in the region was crucial to increase agricultural production by improving irrigation farming.

Table 2 shows the result of the beneficiary survey during the evaluation study on the relevance between the needs of WUC members and the project outputs such as gravity force irrigation (output 1) and small-scale pump irrigation (output 2). Consequently, all members answered “highly relevant” or “relevant”.

Table 2: Relevance to Beneficiaries’ Needs

	Gravity Force Irrigation (Output 1)		Small-Scale Pump Irrigation (Output 2)	
	No. of persons	%	No. of persons	%
(1) Highly relevant	67	93.1	24	85.7
(2) Relevant	5	6.9	4	14.3
(3) Less relevant	0	0	0	0
(4) Not relevant at all	0	0	0	0
Total	72	100	28	100

Source: Beneficiary Survey

In addition, the farmers’ needs for WHT such as pond, tank and shallow well (output 3)

were very high in areas where there was no water source nearby or in dry areas. Before the project started, the regional government had constructed many ponds, tanks and shallow wells. However, according to the report by JICA and an interview with OWMEB, the farmers in the area were unable to utilize the facilities due to a lack of training on maintenance and farming technology, hence the project put more emphasis on the maintenance and extension of WHT to other farmers.

In short, the project was highly relevant with the development needs of the country.

3.1.3 Relevance with Japan's ODA Policy

In the Country Assistance Implementation Plan of JICA in 2002, agricultural development (food security) was one of the four priority areas. The project was initially proposed by the fact-finding study on agricultural development conducted by JICA in 2000 and the development study on Meki Irrigation and Rural Development in 2002. Subsequently, the country assistance program for Ethiopia was formulated by the Ministry of Foreign Affairs in 2008, citing agricultural development as the top priority. The program promoted research and development into agricultural technology, extension and input support for improved technology, and the construction of irrigation facilities, including WHT, as well as support for soil conservation, hence the project was consistent with Japan's ODA policy.

3.1.4 Appropriateness of Means

The target areas of the project were selected as East Shewa and Arsi zones of five zones which had been supported by the development study on capacity building programs for community-based irrigation development in the central Oromia region. When selecting a more specific area for gravity force irrigation (output 1), OIDA's irrigation database was utilized to analyze 37 areas[4] in the central Oromia region. Consequently, Ketar I, II, III[5] were selected due to the deterioration in the facilities and Arata Chufa[6] was selected due to its good location as a pilot and the inactive situation of WUA. For small-scale pump irrigation (output 2), two out of nine areas were selected with potential water resources such as underground water or lakes. The two areas had problems in maintenance of pumps, management of WUA and water utilization. For WHT (output 3), 27 model farmers were selected in areas where there were many family-based ponds, tanks and shallow wells constructed by the regional government. Table 3 shows the target areas and the reasons for selection.

[4] Planned irrigated area: 4,903ha, Actual irrigated area: 3,008ha, Planned beneficiaries: 13,484, Actual beneficiaries: 8,063

[5] Actual irrigation rate: 50%, Actual irrigated area: 200ha, Actual beneficiaries: 320

[6] Actual irrigation rate: 80%, Actual irrigated area: 80ha, Actual beneficiaries: 250

Table 3: Target Areas and Reasons for Selection

	Output 4: Irrigation farming technology						
	Output1: Gravity force		Output 2: Small-scale pumps		Output 3: WHT		
District	Tiyo	Ziway Duguda	Duguda	Bora	Adami Tulu	Dodota Shire	Merti
Area (WUA/WUC)	Ketar I, II, III	Arata Chufa	Badegosa	Kanteri Michael	Model farmers	Model farmers	Model farmers
Reasons for Selection	Old facilities, low irrigation rate	Inactive WUA, good location as a pilot	Problems in maintenance of pump and management of WUA	Problems in maintenance of pump and management of WUA	Existing facilities were not utilized. Farmers had willingness for WHT.		

Source: Based on the JICA report

Therefore, the selection of the target area was consistent with the issues and conditions in the target area, and appropriate to show the direction of the project, which aimed to improve water utilization technology.

In summary, this project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness and Impact (Rating: ③)

3.2.1 Project Outputs

3.2.1.1 Project Output

1) Output 1

Through the implementation of the project, the following results were achieved for output 1:

a) Rehabilitation of gravity force irrigation schemes was standardized through the consensus of WUC/UWA and the guideline including the rehabilitation process was prepared.
b) Gravity force irrigation schemes were rehabilitated by the participation of WUC/WUA in the standardized way.

As shown in Table 4, there were seven steps to the rehabilitation work in the guideline for rehabilitation of gravity-forced irrigation scheme.

Table 4: Standardized Rehabilitation Process of the Gravity Force Irrigation Scheme

	Process	Outline of Work
Step 1	Request and Proposal	・ Consensus among beneficiaries of WUC/WUA on request for rehabilitation ・ Baseline survey and inventory survey on irrigation scheme by WUC/WUA

		・ Preparation and submission of the proposal and request to Zone/Woreda office
Step 2	Problem Analysis	・ Problem Analysis workshop facilitated by Zone/Woreda office
Step 3	Basic Plan and Design	・ Field survey on the topography, geology and soil by Zone/Woreda office ・ Preparation of basic plan (layout map) ・ Strengthen capacity of WUC/WUA ・ Preparation of design ・ Cost and benefit estimation ・ Preparation of an action plan
Step 4	Agreement	・ Signing of an agreement between the Zone/District and WUC/WUA ・ Clarification of responsibility of WUC/WUA on rehabilitation work
Step 5	Implementation	・ Confirmation of design by Zone/Woreda office ・ Cost Revision by Zone/Woreda office ・ Rehabilitation work featuring WUC/WUA involvement ・ Supervision and inspection by Zone/Woreda office
Step 6	Management	・ Formulation of a water distribution plan ・ Maintenance of facilities by beneficiaries ・ Data management by WUC/WUA ・ Training for WUC/WUA by OWRB
Step 7	Monitoring and Evaluation	・ Periodical monitoring by Zone/District and WUC/WUA ・ Mid-term evaluation during the five-year regional development plan ・ Training and technical support for WUC/WUA by OWRB

Source: Guideline for Rehabilitation Works of the Small-Scale Gravity-Forced Irrigation Scheme, OWMEB

During the project implementation, the counterparts of OWMEB developed the above process in Ketar I, II, II and Arata Chufa by trial and error, supported by Japanese experts. They went to the field many times to try the process with the WUC/WUA committee members. The interview with OWMEB revealed that through this experience, the counterparts could develop their capacity and gain basic knowledge for the guideline preparation. In addition, the counterparts improved their understanding of the whole process of rehabilitation and how to utilize the documentation package by preparing formats for the request form, action plan, agreement, layout map, design, cost estimate, monitoring sheet, and so on.

Similarly, according to the interview with OWMEB, the counterparts in the headquarters, Zone and Woreda offices came to appreciate collaborating with WUC/WUA through the above process. In response, WUC/WUA became active participants in the process from the planning stage, with a sense of ownership, rights and responsibility. This is because, for example, during the Problem Analysis Workshop and Action Plan making

at the initial stage, WUC/WUA members identified their own problems in facility management and prepared an action plan to solve the same. Another example is that in step 4, the agreement between Zone/District and WUC/WUA was signed to clarify the responsibility of WUC/WUA on rehabilitation work. This process made the members of WUC/WUA more aware of their roles and responsibilities and more active in rehabilitation work.

Table 5 shows the level of participation of WUC/WUA members in the rehabilitation work based on the result of the beneficiary survey[7] conducted during the evaluation study. It shows that 100% of members in Ketar I, II, II and 96.4% in Arata Chufa answered "participated" or "actively participated"[8].

Table 5: Participation of WUC/WUA in Rehabilitation of Gravity Force Irrigation (%)

	Ketar I, II, III			Arata Chufa		
	Not participated	Participated	Actively participated	Not participated	Participated	Actively participated
Rehabilitation work	0.0	23.8	76.2	3.6	17.9	78.6

Source: Beneficiary Survey

2) Output 2

Through the implementation of the project, the following results were achieved for output 2:

a) Management of small-scale irrigation schemes was improved in Badegosa and Kentri Michael through organizational strengthening of WUC/WUA.
b) The guideline, including WUC/WUA management and maintenance of pumps, was revised.

In Badegosa, irrigation water was pumped up from Lake Ziway, and in Kentri Michael, it was pumped up from underground. According to the beneficiary survey[9], all beneficiaries answered that their understanding of water rights and their awareness as a member of WUC/WUA as well as their ability to manage the organization had improved thanks to the project. Three reasons were given for this: 1) a clear by-law of WUC/WUA was established through training on organizational management, 2) the members developed a sense of ownership of operation and maintenance of the scheme by learning how to periodically inspect the pump as part of training on operation and maintenance, 3)

[7] A beneficiary survey was conducted for 42 of 857 members in Ketar I, II and III and 30 of 317 members in Arata Chufa.
[8] "Participated" means the person was physically there and conducted activity as necessary. "Actively participated" means the person took the initiative in discussion or activity.
[9] The beneficiary survey targeted all members of the WUC (14 in Badegosa and 14 in Kentri Michael).

periodical meetings were held once or twice a month by WUC/WUA members to share information.

Tables 6 and 7 show the evaluation results by the WUC on the management of irrigation schemes, before, during and after the project.

Table 6: Evaluation by Badegosa WUC on the Management of Irrigation Schemes (%)

List of activities	Level of satisfaction	Before the project	During the project	After the project
Distributions of water in area	Unsatisfactory	100.0	0.0	0.0
	Fairly satisfactory	0.0	78.6	0.0
	Satisfactory	0.0	21.4	85.7
	Highly satisfactory	0.0	0.0	14.3
Maintenance of canals	Unsatisfactory	100.0	0.0	0.0
	Fairly satisfactory	0.0	71.4	0.0
	Satisfactory	0.0	21.4	78.6
	Highly satisfactory	0.0	7.2	21.4
Status of infrastructures in the schemes	Unsatisfactory	100.0	0.0	0.0
	Fairly satisfactory	0.0	78.6	0.0
	Satisfactory	0.0	21.4	92.9
	Highly satisfactory	0.0	0.0	7.1
Safety structures	Unsatisfactory	100.0	0.0	0.0
	Fairly satisfactory	0.0	78.6	14.3
	Satisfactory	0.0	21.4	85.7
	Highly satisfactory	0.0	0.0	0.0

Source: Beneficiary Survey

Table 7: Evaluation by Kentri Michael WUC on the Management of Irrigation Schemes (%)

List of activities	Level of satisfaction	Before IFI project	During IFI project	After IFI project
Distributions of water in area	Unsatisfactory	100.0	0.0	14.3
	Fairly satisfactory	0.0	42.9	57.1
	Satisfactory	0.0	57.1	28.6
	Highly satisfactory	0.0	0.0	0.0
Maintenance of canals	Unsatisfactory	100.0	0.0	7.1
	Fairly satisfactory	0.0	21.4	57.2
	Satisfactory	0.0	78.6	35.7
	Highly satisfactory	0.0	0.0	0.0
Status of infrastructures in the schemes	Unsatisfactory	100.0	0.0	0.0
	Fairly satisfactory	0.0	28.6	71.4
	Satisfactory	0.0	71.4	28.6
	Highly satisfactory	0.0	0.0	0.0
Safety structures	Unsatisfactory	100.0	0.0	14.3
	Fairly satisfactory	0.0	64.3	78.6
	Satisfactory	0.0	35.8	7.1
	Highly satisfactory	0.0	0.0	0.0

Source: Beneficiary Survey

According to the results above, before the project, not all members were satisfied with the management of the scheme due to unfair distribution of water among the beneficiaries. This was also because they did not work collectively to manage the facilities. During the project, the situation improved, hence all members answered “fairly satisfactory”, “satisfactory” or “highly satisfactory”. After the project, the members in Badegosa were far more satisfied, with an increase of 57.2% for those who answered “satisfactory” and 8.9% for those who answered “highly satisfactory” on average. In Kentri Michael, the figure for those who answered “highly satisfactory” declined by 8.9% on average due to the reduced irrigated area caused by a pump engine problem. However, the pump was fixed using the WUC’s own funds and some members later jointly purchased a new pump, which reflects their new awareness of their roles in operation and maintenance.

(A newly purchased pump)

(Water is pumped up from underground)

To operate and manage the WUC/WUA, including fixing and renewing pumps, membership fees must be continuously collected. In both Badegosa and Kentri Michael, the collection of membership fees such as water fees and maintenance fees increased during the project and their financial management was improved. This was because the members understood the importance of collecting membership fees to maintain the scheme. Consequently, the collection of fees created a virtuous cycle in which the WUC/WUA could fix or purchase a pump quickly when it was broken down.

Tables 8 and 9 show the evaluation results by the WUC on the membership fees and financial management, before, during and after the project.

Table 8: Evaluation by Badegosa WUC on Membership Fees and Financial Management

(%)

List of activities	Level of satisfaction	Before the project	During the project	After the project
Collection of water fee	Unsatisfactory	100.0	57.2	57.2
	Fairly satisfactory	0.0	21.4	14.3
	Satisfactory	0.0	21.4	21.4
	Highly satisfactory	0.0	0.0	7.1
Collection of maintenance fee	Unsatisfactory	100.0	7.2	0.0
	Fairly satisfactory	0.0	71.4	21.4
	Satisfactory	0.0	21.4	71.4
	Highly satisfactory	0.0	0.0	7.2
Collection of other fees (fines levied)	Unsatisfactory	100.0	21.4	7.2
	Fairly satisfactory	0.0	42.9	21.4
	Satisfactory	0.0	35.7	71.4
	Highly satisfactory	0.0	0.0	0.0
Financial management	Unsatisfactory	100.0	7.2	0.0
	Fairly satisfactory	0.0	71.4	35.7
	Satisfactory	0.0	21.4	57.1
	Highly satisfactory	0.0	0.0	7.2

Source: Beneficiary Survey

Table 9: Evaluation by Kentri Michael WUC on Membership Fees and Financial Management (%)

List of activities	Level of satisfaction	Before the project	During the project	After the project
Collection of water fee	Unsatisfactory	100.0	0.0	21.4
	Fairly satisfactory	0.0	78.6	7.1
	Satisfactory	0.0	21.4	71.4
	Highly satisfactory	0.0	0.0	0.0
Collection of maintenance fee	Unsatisfactory	100.0	0.0	35.7
	Fairly satisfactory	0.0	28.6	28.6
	Satisfactory	0.0	71.4	35.7
	Highly satisfactory	0.0	0.0	0.0
Collection of other fees (fines levied)	Unsatisfactory	100.0	0.0	42.9
	Fairly satisfactory	0.0	50.0	35.7
	Satisfactory	0.0	50.0	21.4
	Highly satisfactory	0.0	0.0	0.0
Financial management	Unsatisfactory	100.0	0.0	0.0
	Fairly satisfactory	0.0	28.6	57.1
	Satisfactory	0.0	71.4	42.9
	Highly satisfactory	0.0	0.0	0.0

Source: Beneficiary Survey

In addition, both WUAs of Badegosa and Kentri Michael were upgraded to WUCs and

became able to access external funding. They opened bank accounts and invested in the Water Users' Union (WUU) collectively.

3) Output 3

Through the implementation of the project, the following results were achieved for output 3:

a) WHT, including a pond, tank and shallow well, was standardized as an appropriate technology in the project area and they were constructed at the model farms.
b) The guideline, technical manual and Q&A on WHT were prepared.
c) WHT was extended from the model farmers to other farmers in the vicinity through exhibition events and daily practice.

Details of WHT by type, location and activity are shown in Table 10.

Table 10: Water Harvesting Technology at Model Farms (No. of households)

Type	Location (Woreda)			Activity		Total
	Adami Tulu	Dodota Shire	Merti	Construction	Rehabilitation	
Pond	4	5	6	1	14	15
Tank	2	4	4	4	6	10
Shallow well	2	0	0	2	0	2
Total	8	9	10	7	20	27

Source: Prepared by the evaluator based on JICA-provided materials

To prepare the guideline, technical manual and Q&A, the Japanese experts and counterparts developed drafts through on-the-job training (OJT), reflecting their experience, opinions as well as technical conditions in the field. They validated the utility of the drafts in the field as a trial. To finalize the guideline, all stakeholders were invited to a workshop in Addis Ababa to give comments and suggestions. Through this OJT process, the counterparts, who had been passive initially due to their limited experience in guideline preparation, participated actively in the work and acquired the capacity to develop practical contents of the guideline based on practice in the field. The guideline, technical manual and Q&A on WHT were finalized before the project completion.

During the project, model farmers were provided with a treadle pump, drip irrigation kits, plastic sheets and vegetable seeds as well as technical training on how to use them. Periodical monitoring by the implementing agency was also conducted. Table 11 shows the monitoring results for 23 of 27 model farmers during the project. The results show that although (1) 21 farmers irrigated their farms using WHT in both January 2007 and 2008, there were several problems in 2007 such as (2) drip irrigation kits were hardly used, and (4) half of them did not remove litter and mud from WH. The scope of the

project thus included the training on operation and maintenance of WH. This training convinced more farmers of the importance of operation and maintenance and the monitoring results in 2008 were improved as shown in Table 11.

Table 11: Application, Operation and Maintenance of WHT (No. of farmers)

Item	January 2007		January 2008	
	Yes	No	Yes	No
(1) Did you irrigate your farm using WHT?	21	1	21	0
(2) Did you use drip irrigation kits?	8	14	14	7
(3) Did you use a lifting device (treadle pump)?	16	4	15	3
(4) Did you remove litter and mud from WH?	10	11	10	10
(5) Did you remove litter and mud from the silt trap and waterway?	14	7	18	2

Source: Prepared by the evaluator based on JICA-provided materials

Table 12 shows the result of the beneficiary survey conducted for 24 model farmers on the extension of WHT to other farmers in the project area. All model farmers accepted the visitors from the neighborhood, who expressed high interests in WHT. In addition, 22 of 24 farmers answered that they had disseminated the knowledge obtained from the project to others. According to the interview with the counterpart in Merti district, it emerged that eight farmers in the project area had newly introduced WHT.

Table 12: Extension of WHT from Model Farmers to Other Farmers (No. of farmers)

Item	Yes	No
(1) Did you have a visitor to your farm?	24	0
(2) Did the person who came to see the WH facility want WH?	24	0
(3) Did the person who visited the WH facility want to receive training?	24	0
(4) Have you disseminated the knowledge obtained from the project to others?	22	2

Source: Beneficiary Survey

During the initial stage of the project, the objective was to utilize WHT for small-scale irrigation farming, particularly vegetable production. However, according to the interview with the beneficiaries and field observation, it was clear that the objective of WHT had changed to include the multi-purpose utilization of water in their daily activities, such as fruit production, nursery preparation, drinking water for livestock, and supplementary irrigation for crops.

4) Output 4

The project has helped improve farming technology by agricultural training for WUC/WUA and model farmers and experiments in water-saving technology in the project area where outputs 1 to 3 had been achieved.

The experiment on water-saving technology in Adami Tulu demonstrated the effects on the growth of crops and an appropriate amount of water in soil by crop and irrigation type and space. In addition, the experiment verified the effectiveness of evaporation control technology using plastic sheets, foam polystyrene, and furrow irrigation. Based on these experiments, crop calendars and leaflets on the necessary amount of water per crop such as onion and tomato were prepared and utilized in the farmers' training. In Arata Chufa WUC, the crop calendar and other information/data on farming were displayed on the wall at the WUC office, visible to all members at any time.

Training on gravity force irrigation related to output 1 included five areas such as organizational management, irrigation water management, irrigation facility management, irrigation farming technology and financial management for WUC. According to the beneficiary survey of 30 members in the Ketar WUC and 42 members in the Arata Chufa WUC, 89.0% of Ketar and 58.6% of Arata Chufa members participated in the training in all five areas. Table 13 shows the extent to which the knowledge and techniques acquired from the training were effective in managing the irrigation scheme.

Table 13: Extent of Utilization of Training on Gravity Force Irrigation

Training Area	Extent of Utilization	Ketar I, II, III (%)	Arata Chufa (%)	Example of Utilization
Organizational Management	(1) Less	15.0	0.0	・Increased number of members
	(2) To some extent	37.5	31.2	・Improved awareness of the WUC rules
	(3) Very much	47.5	68.8	・Compliance with regulation
Irrigation Water Management	(1) Less	19.5	0.0	・Water sharing (by shift), fair distribution of water
	(2) To some extent	46.3	36.8	・Irrigation scheduling
	(3) Very much	34.2	63.2	・Saving water
Irrigation Facility Management	(1) Less	14.6	0.0	・Preventing structural damage
	(2) To some extent	53.7	16.7	・Periodical maintenance of canal
	(3) Very much	31.7	83.3	・Sense of ownership is existing
Irrigation Farming Technology	(1) Less	39.0	0.0	・Control of excess irrigation water
	(2) To some extent	29.3	27.8	・Use of the furrow irrigation method
	(3) Very much	31.7	72.2	

Financial Management	(1) Less	10.0	0.0	・Auditing the income of WUC
	(2) To some extent	47.5	31.2	・Savings in bank and buying shares from union
	(3) Very much	42.5	68.8	・Wise use of income generated from irrigation

Source: Beneficiary Survey

The above result shows that despite the variability in Ketar, on average, more than 80% answered that they had utilized the training "to some extent" or "very much". In Arata Chufa, all members answered that they had utilized all training "to some extent" or "very much". Examples of utilization included increased number of WUC members, improved awareness of the WUC rules, fair distribution of irrigation water, preparation of an irrigation schedule, preventing structural damage, periodical maintenance of the canal, control of excess irrigation water, auditing the income of WUC, savings in the bank and wise use of income generated from irrigation.

In relation to output 2, a series of training for WUC was one of the factors contributing to strengthen the organization and improve the management of small-scale irrigation schemes in Badegosa and Kentri Michael. The contents of the training included the same five areas as for gravity force irrigation. According to the beneficiary survey for 14 members in Badegosa WUC and Kentri Michael WUC respectively, all of them participated in the training in all five areas. Table 14 shows the extent to which the knowledge and techniques acquired from the training were effective in managing the irrigation scheme.

Table 14: Extent of Utilization of Training on Small-Scale Pump Irrigation

Training Area	Extent of Utilization	Badegosa (%)	Kentri Michael (%)	Example of Utilization
Organizational Management	(1) Less	0.0	0.0	・Improved awareness of the WUC rules
	(2) To some extent	40.0	21.4	・Compliance with regulation
	(3) Very much	60.0	78.6	
Irrigation Water Management	(1) Less	10.0	0.0	・Irrigation scheduling
	(2) To some extent	20.0	14.3	・Improvement of water distribution
	(3) Very much	70.0	85.7	・Saving water
Irrigation Facility Management	(1) Less	0.0	0.0	・Periodical maintenance of canal
	(2) To some extent	55.6	21.4	・Collaborating with committee for maintenance work
	(3) Very much	44.4	78.6	・Sense of ownership is existing
Irrigation	(1) Less	0.0	0.0	・Control of excess irrigation water

Farming Technology	(2) To some extent	44.4	21.4	・Use of the furrow irrigation method
	(3) Very much	55.6	78.6	・Use of improved agricultural inputs
Financial Management	(1) Less	0.0	0.0	・Auditing the income of WUC
	(2) To some extent	57.1	21.4	・Savings in bank
	(3) Very much	42.9	78.6	・Collective investment in Union

Source: Beneficiary Survey

The above result shows that in Badegosa, except for training on irrigation water management, all members answered that they had utilized the training "to some extent" or "very much". In Kentri Michael, all members answered that they utilized all training "to some extent" or "very much". The examples of utilization were almost the same as for gravity force irrigation, but they also included collaboration with the WUC committee for maintenance work, the use of improved agricultural inputs and collective investment in the union.

In relation to output 3, the project conducted training on WHT such as facilities, materials and equipment, operation and maintenance of the drip irrigation system, nursery preparation, nursery growing, prevention of crop diseases, water-saving technology and marketing. According to the monitoring for model farmers in January 2007 and 2008, all farmers answered that they had utilized the knowledge and techniques acquired through the training.

In summary, outputs 1, 2, 3 and 4 were generally achieved.

3.2.1.2 Achievement of Project Objectives

Three indicators were set during the Progress Review Mission in March 2007 for the Project Objective of "water utilization technology is improved by the farmers in the project target area".

1) Indicator 1: The guidelines were authorized by OWRB.

According to the interview with the OWMEB headquarters and JICA-provided materials, the guidelines (in English) were authorized by OWRB and distributed to all stakeholders such as the Zone and Woreda office. The guidelines in Oromo were also prepared, but not finalized and authorized even at the time of this evaluation.

2) Indicator 2: OWRB staff understand the guidelines.

According to the interview with OWMEB headquarters and JICA-provided materials, not only the counterpart of OWRB but also high level officials understood the guidelines. They discussed the contents of the guidelines and revised them many times before the authorization procedure.

3) Indicator 3: The guidelines were applied to other projects implemented by OWRB. (After April 2008)

According to the JICA-provided materials, the guidelines were applied to other projects by OWRB staff. In addition, the results of the beneficiary survey on improvement of irrigation water utilization are shown in Table 15. The survey focused on the changes in improvement from 2004 and 2008 to 2012.

Table 15: Improvement in Irrigation Water Utilization by Beneficiaries (%)

Item	Evaluation	Gravity Forced Irrigation		Small scale pump irrigation		WHT		average
		during IFI	After IFI	during IFI	After IFI	during IFI	After IFI	
Change in availability of water	Decreased	0.0	0.0	0.0	0.0	0.0	3.7	20.5
	No Change	12.6	15.5	32.1	7.1	16.7	42.6	
	Increase less than by 100%	66.8	32.7	64.3	85.7	79.6	37.0	79.5
	Double or more than 100%	20.6	51.8	3.6	7.1	3.7	16.7	
Change in adequacy of water to meet the demand	Decreased	0.0	0.0	0.0	0.0	0.0	5.6	25.6
	No Change	11.5	28.6	32.1	17.9	33.3	51.8	
	Increase less than by 100%	73.4	25.6	64.3	67.9	53.7	38.9	74.3
	Double or more than 100%	15.1	45.8	3.6	14.3	13.0	3.7	
Change in multiple use of water	Decreased	0.0	0.0	0.0	0.0	0.0	5.6	29.8
	No Change	13.4	0.0	50.0	32.1	25.9	37.0	
	Increase less than by 100%	83.0	50.1	39.3	60.7	70.4	42.6	70.2
	Double or more than 100%	3.7	49.9	10.7	7.1	3.7	14.8	

Source: Beneficiary Survey

The above result shows that more than 70% of farmers on average increased 1) the available amount of irrigation water, 2) the adequacy of the irrigation of water to meet demand, and 3) the multiple use of irrigation water.

For gravity force irrigation, more than 80% of farmers on average answered that all three items “increased by less than 100%” or “by double or more than 100%” during the project.

For small-scale irrigation, approximately 68% answered that they increased the available water and adequacy of water during the project. After the project, they increased further due to the expansion of the irrigated area by extending the waterway.

For WHT, it is noted that the available amount of water increased approximately 83%

and the multiple use of water increased approximately 74% during the project. After the project, the results differed by location since the model farmers had differing levels of techniques, economic conditions as well as geological conditions. In the farms where the results worsened after the project, there were some problems. For example, the tank had cracks due to the soil condition; wild animals drunk water from the facilities and damaged the plastic sheets due to the lack of a fence; and litter and mud had accumulated in the silt trap and waterway.

In summary, the project has largely achieved its objectives; therefore its effectiveness is high.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

Two indicators were set during the Progress Review Mission in March 2007 for the Overall Goal of "the agricultural production in the project target area is increased" despite no numerical target.

1) Indicator 1: Production of major products is increased in the project area.

Tables 16 and 17 show that the production of major crops increased by 33.0% for cereals and 20.27% for pulses in the East Shewa Zone and 24.46% for cereals and 46.06% for pulses in the Arsi Zone. Vegetable production decreased by 16.37% in the East Shewa Zone, but tomato production increased by 34.28%. In the Arsi Zone, the only existing data on vegetable production was for cabbage, which increased by 200.23%.

2) Indicator 2: Productivity of major products increased in the project area.

Tables 16 and 17 also show that the productivity of major crops increased by 37.87% for cereals and 48.31% for pulses in the East Shewa Zone and 21.97% for cereals and 20.66% for pulses in the Arsi Zone. Vegetable production increased by 10.64% in the East Shewa Zone, and tomato's productivity in particular increased by 25%. In the Arsi Zone, the productivity of cabbage increased by 269.82%.

Table 16: Production and Productivity of Major Products in the East Shewa Zone

	Production (Quintals)			Yield (Qts/Ha)		
	2004/2005 (Before)	2010/2011 (After)	% Change	2004/2005 (Before)	2010/2011 (After)	% Change
Cereals	*4,832,714.00*	*6,430,929.92*	*33.07*	*13.25*	*18.26*	*37.87*
Teff	1,478,455.00	2,705,783.74	83.01	10.89	13.95	28.10
Barley	230,022.00	132,926.51	-42.21	12.69	12.47	-1.73
Wheat	1,173,242.00	978,164.14	-16.63	15.84	17.77	12.18
Maize	1,786,387.00	2,123,351.55	18.86	15.95	23.90	49.84
Sorghum	136,903.00	489,115.77	257.27	10.86	23.22	113.81
Pulses	*928,580.00*	*1,116,800.30*	*20.27*	*11.42*	*16.94*	*48.31*
Faba Beans	118,919.00	163,673.43	37.63	16.53	16.83	1.81
Field Peas	109,945.00	47,714.69	-56.60	13.44	16.85	25.37
Haricot beans	463,307.00	366,297.37	-20.94	10.45	17.07	63.35
Chick-Peas	153,482.00	340,707.34	121.99	10.11	19.73	95.15
Lentils	18,779.00	145,073.38	672.53	8.31	14.53	74.85
Grass Peas	55,660.00	51,340.10	-7.76	9.69	16.63	71.62
Vegetable	*217,232.00*	*181,673.36*	*-16.37*	*92.13*	*101.92*	*10.64*
Cabbage	101,226.00	72,147.92	-28.73	104.84	99.75	-4.86
Tomato	54,408.57	73,058.84	34.28	89.2	111.50	25.00
Green pepper	39,137.00	6,338.38	-83.80	105.86	92.01	-13.08
Garlic	14,363.00	5,643.10	-60.71	123.63	124.38	0.61

Source: Central Statistical Agency

Table 17: Production and Productivity of Major Products in the Arsi Zone

	Production (Quintals)			Yield (Qts/Ha)		
	2004/2005 (Before)	2010/2011 (After)	% Change	2004/2005 (Before)	2010/2011 (After)	% Change
Cereals	*8,518,016.00*	*10,601,811.61*	*24.46*	*16.66*	*20.33*	*21.97*
Teff	659,018.00	1,046,917.05	58.86	8.96	12.71	41.85
Barley	2,178,664.00	2,450,044.91	12.46	18.81	23.75	26.26
Wheat	3,805,387.00	4,385,515.72	15.24	20.63	21.94	6.35
Maize	1,505,615.00	1,772,403.78	17.72	20.03	24.69	23.27
Sorghum	329,975.00	931,068.98	182.16	15.94	27.46	72.27
Oats	39,357.00	15,861.17	-59.70	15.61	11.40	-26.97
Pulses	*674,639.00*	*985,351.22*	*46.06*	*12.41*	*14.97*	*20.66*
Faba Beans	384,604.00	632,778.12	64.53	17.72	18.77	5.93
Field Peas	125,194.00	186,550.88	49.01	13.96	12.95	-7.23
Haricot beans	117,651.00	125,645.09	6.79	9.48	14.72	55.27
Lentils	13,491.00	12,864.52	-4.64	8.46	9.98	17.97
Vegetable	*333,806.18*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Cabbage	22,374.58	67,174.53	200.23	28.00	103.55	269.82
Tomato	211,329.63	N/A	N/A	78.00	N/A	N/A
Red pepper	75,836.98	N/A	N/A	17.70	N/A	N/A

Source: Central Statistical Agency

It is noted that existing data concerning the production and productivity of major products covered only the Zone levels and no specific data was available at Woreda or village levels, making it difficult to analyze the causal relationship between the project contributions to the existing data. Considering the numbers of project beneficiaries, the data at Zone levels were excessive.

It emerged that the majority of farmers in the project area became able to harvest twice or three times a year, including dry seasons. For example, according to the interview with Badegosa and Kentri Michael, the WUC members who produced only maize during rainy seasons before the introduction of the small-scale pump, they could produce various products such as onions and tomatoes after its introduction, hence it can be assumed that the production of major products increased in the project area.

In addition, the results of the beneficiary survey on the change in production of major crops by irrigation scheme at the time of this evaluation were shown in Table 18. The survey compared the production of crops and vegetable produced in 2004 and 2011, since the beneficiaries grow various products.

Table 18: Change in Production in the Project Area (before and after comparison) (%)

	Gravity Force Irrigation		Small Pump Irrigation		WHT		
	KetarI,II,III	Arata Chufa	Badegosa	Kentri Michael	Adami Tulu	Dodota Shire	Merti
Decreased	4.8	0.0	0.0	0.0	0.0	0.0	0.0
No Change	2.4	0.0	0.0	14.3	33.3	33.3	33.3
Increase less than by 100%	19.0	48.1	78.6	78.6	33.3	50.0	33.3
Double or more than 100%	73.8	51.9	21.4	7.1	33.3	16.7	33.3

Source: Beneficiary Survey

Consequently, the production by beneficiaries increased by more than 90% for gravity force irrigation, more than 85% for small-scale pump irrigation and more than 65% for WHT on average. In particular, 73.8% in Ketar I, II, III and 51.9% in Arata Chufa answered that their production had more than doubled (100%), which was much higher than the average increase in 47.1% at the Zone level. The reasons for this high increase were: the irrigated area was expanded by rehabilitation work of the project; and more products could be produced by irrigation during dry seasons and supplementary irrigation during rainy seasons. In addition, as shown by Table 15, the use of irrigation water was continued and established by the beneficiaries after the project.

In summary, the overall goal was largely achieved for its target indicators, therefore its impact is high.

3.2.2.2 Other Impacts

The interview with OWMEB headquarters revealed that the guideline on gravity force irrigation was used by its staff for other rehabilitation projects such as Sara Weyba and Sogido. According to OWMEB Zone office, several international organizations such as IFAD, FAO, and NGO also recognized that the guideline was useful.

Regarding the impact on the natural environment, the terminal evaluation report pointed out concern that the level of groundwater would decline in areas where the massive introduction of small-scale pumps was encouraged. According to OWMEB at the time of this evaluation, there was no accurate data on the level of groundwater and the concern remained. In the near future, a boring survey will be conducted at dozens of sites around Meki.

In addition, during the terminal evaluation it was also pointed out that the farmers who lived downstream of the irrigated area might suffer from water shortages. However, there has been no conflict between the WUC/WUA, since no one lived immediately downstream of Ketar and Arata Chufa.

Another indirect impact includes the diversification of crops in the project area. According to the beneficiary survey, all answered that they had increased the type of products by two or more, which means that the introduction and improvement of irrigation technology and irrigation farming training under the project enabled the farmers to produce cash crops such as tomato and onions as well as major crops such as maize and teff.

In short, the evaluation results of the effectiveness and impact indicate that the project has largely achieved its objectives by preparing guidelines on small-scale irrigation, and has achieved its overall goal; therefore its effectiveness is high.

3.3 Efficiency (Rating: ③)

3.3.1 Inputs

The planned and actual inputs of the project are shown in the table below.

Japanese side	Planned	Actual
Total cost	350,000,000 Japanese Yen	295, 840,000 Japanese Yen
Duration	September 2005 to September 2008 (3 years)	September 2005 to September 2008 (3 years)
Dispatch of Japanese Experts	Long-term Expert: 2 positions (Chief Advisor/Irrigation Facilities, and Coordinator/Farmer Organization)	Long-term Expert: total of 4 persons in three positions (Chief Advisor/Irrigation Facilities, Coordinator/Farmer Organization, and Design/Construction Management)

	Short-term Expert: 2 to 3 persons per year as required	Short-term Expert: total of 17 persons
Counterpart training in Japan	3 persons per year Fields of training: undecided	Total of 12 persons Fields of training: small-scale irrigation management, sustainable water resource development in terms of agricultural and rural development
Counterpart training in third countries	Fields of training: undecided	Fields of training: small-scale irrigation management (Morocco)
Equipment	Decided through discussion with the Ethiopian side	25,010,000 Japanese Yen
Local operation cost	Provision of local operation cost	38,350,000 Japanese Yen
Others	Rehabilitation of existing irrigation schemes	None
Ethiopian side	Planned	Actual
Assignment of counterparts	Project Director, Project Manager, staff of Irrigation, Agricultural Production, and Cooperative Department in OWRB and staff of Agricultural and Rural Development Department in East Shewa and Arsi Zone offices	Total of 39 persons
Land and facilities	Provision of the necessary facilities	Project office space
Others	Provision of local operation cost	None

3.3.1.1 Elements of Inputs

Regarding the inputs from the Japanese side, a long-term expert (Design/Construction Management) and some short-term experts were additionally dispatched for the following reasons, which were relevant: 1) At the project planning stage, the level of targets for the project objective and outputs were unclear, 2) The scale of the project (e.g. the number of target areas, cooperatives, and farmers) were undecided initially; 3) Two long-term experts were insufficient to cover four outputs of the project with a wider scope; and 4) New activities, such as flood irrigation, were added to the project during the project review mission.

However, due to the delay in dispatching short-term experts, the project activities, which were closely linked with a seasonal cropping calendar at the field level, were also delayed. During this evaluation, counterparts of OWMEB pointed out that some of the activities had not been efficiently implemented due to the delay in dispatching short-term experts.

Regarding the inputs from the Ethiopian side, only six of thirty-nine counterparts (one at the headquarters and five at Woreda offices) had been engaged in the project activities throughout the project period. This was due to frequent personnel transfers due to continuous organizational changes, hence the project could not effectively materialize the

technical transfer to counterparts or be smoothly facilitated. In addition, the delay in the project activities was significant due to the limited number of counterparts. The Japanese side consulted with the Ethiopian side to improve the situations but the situation did not improve significantly. Some of the activities in the Project Design Matrix (PDM), such as support for the Water Users' Association (WUA) for cooperative registration, were deleted since the responsible department was transferred to another organization due to organizational changes.

Details of the frequent organizational changes were as follows. Initially, the former Oromia Irrigation Development Authority (OIDA) was established as an institution to develop irrigation schemes at a state level in 1999. Subsequently, in December 2004, OIDA was merged into the Oromia Agricultural and Rural Development Bureau (OARDB); a project which started after the merger. Then, OIDA was re-established as an independent authority in October 2005. Through this process, the department of construction was separated from the authority and became a private company. OIDA focused on strategy formulation, research and planning. In December 2007, however, OIDA was re-merged into the Oromia Water Resource Bureau (OWRB). In this process, the agricultural department of OIDA was merged into OARDB. Several organizational changes were implemented even after the project completion. The irrigation section is now under the Oromia Water and Mineral, Energy Bureau (OWMEB) and the agricultural section is under the Oromia Agricultural Bureau (OAB).

As inputs to rehabilitate existing irrigation schemes, the Ethiopian side provided labor, sand and gravel and the Japanese side provided other materials.

3.3.1.2 Project Cost

The total cost of the project was lower than planned. Although the Ethiopian side could not fund the local operation cost, they could provide a project office space, utility cost for the office, and salaries of counterparts.

3.3.1.3 Period of Cooperation

The duration of the project was three years as planned.

In short, the efficiency of the project is high since the inputs were appropriate for producing outputs and achieving the project objective, and both project cost and period of cooperation were as planned. However, there were some issues such as the delay in dispatching short-term experts and the delay in activities caused by frequent transfers and shortage of Ethiopian counterparts due to frequent organizational changes.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy towards the Project

According to interviews at the headquarters of OWMEB, the Oromia regional government is planning to prioritize rehabilitation of gravity irrigation schemes, small-scale pump irrigations, and large-, medium-, and small-scale irrigation development, including WHT, to a greater extent. The Fourth National Five-year Development Plan (Growth and Transformation Plan 2010/2011-2014/2015) stated the following challenges: 1) agricultural development is one of the main measures to achieve economic development, 2) the government will further prioritize the expansion of small-scale irrigation to improve food security and materialize crop diversification, 3) the government should also prioritize medium- and large-scale development to the same extent, and 4) the government will strive to improve productivity and increase cash crop production by disseminating successful cases of model farmers to neighboring farmers. It was assumed that the government would continue to further prioritize policies and institutional arrangements for food security, improvement of agricultural productivities, and irrigation development.

3.4.2 Institutional and Operational Aspects of the Implementing Agency

After the project completion, the irrigation section of OWRB was merged into the department of Irrigation Water Supply and Land Drainage of OWMEB and the agricultural section of OWRB was also merged into OAB. The organogram of OWMEB at the time of this evaluation was shown as figure 1.

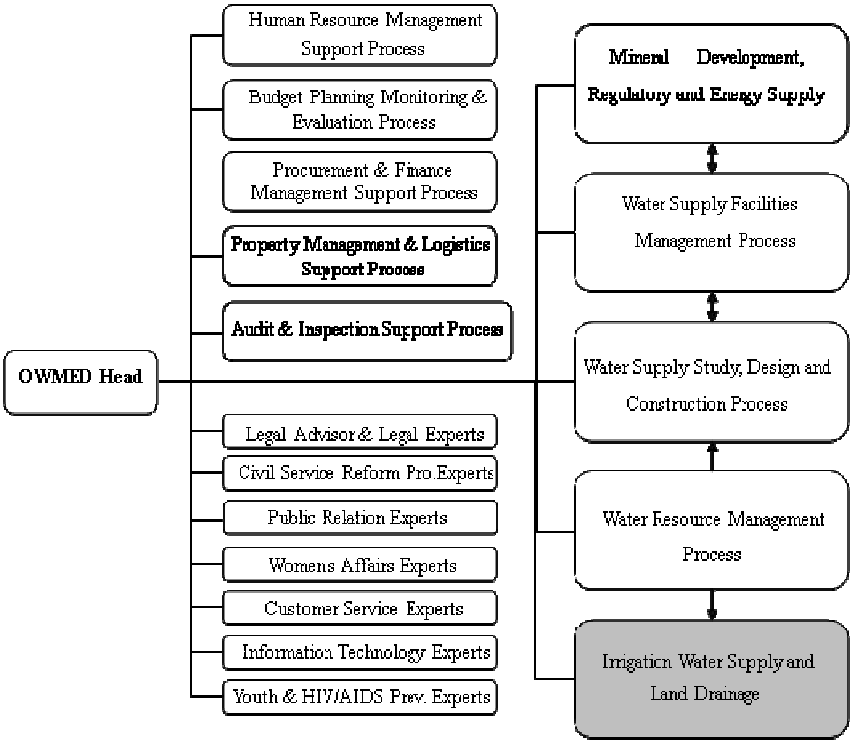


Figure 1: Organogram of OWMEB

Source: OWMEB

During the evaluation, it was identified that under the collaboration system between OWMEB and OAB in terms of extension activities for irrigated agriculture and planning, implementation and evaluation of farmer training had been maintained since after the project completion. Woreda staff and extension officers were closely collaborating to implement activities on the ground. A collaboration system has been maintained for the following reasons: 1) The staff of OWMEB and OAB could easily share information and hold meetings because the two organizations were in the same compound and 2) many staff of OWMEB and OAB could understand the roles of both organizations since they had been frequently transferred among these organizations. It was relatively easy for them to collaborate based on their roles and responsibilities.

The headquarters of OWMEB and Zone offices, however, rarely conducted regular monitoring after the project and could not determine the real situations on the ground. This is because there was no responsible section for monitoring in the organizations. In addition, daily and accommodation allowances set by the government were too small (i.e. 70 and 90 Birr, respectively) to cover the necessary expenses for field trips. Many of the headquarters staff were unwilling to visit fields because they had to cover their own costs even though they stayed in ordinary (not luxurious) accommodation near the fields.

Conversely, Woreda staff were well aware of the circumstances at field level since they had more opportunities to meet and discuss with the WUA/WUC and farmers during the daily field visits.

Table 19 shows the number of OWMEB staff members (plan and current status). The ratios of occupied to planned posts at the headquarters and East Shewa and Arsi zones were 59, 63, and 29%, respectively. The main reason for the low occupancy rates might be the low salary of public servants. Persons working in the private sector may obtain more than ten times the salary compared to that of public servants with equivalent capacities and experience. Accordingly, public servants frequently make job transfers, which may adversely affect the sustainability of staff (counterpart) assignment.

Table 19: Number of OWMEB Staff Members (Plan and Current Status)

No	Qualification	Bureau level		Zone level		
		Plan	Current Status	Plan	Current Status	
					East Shewa	Arsi
1	Process Owner	1	1	1	1	0
2	Engineer	10	5	7	7	4
3	Hydro geologist	2	0	1	0	0
4	Geologist	2	1	1	0	0
5	Agronomist	2	2	1	2	1
6	Environmentalist	2	2	1	0	1
7	Soil Expert	2	0	1	0	0
8	Soil Laboratory Technician	2	0	0	0	0
9	Socio Economist	2	1	1	1	0
10	Sociologist	2	1	1	1	0
11	Surveyor	4	3	3	1	1
12	Mechanical Engineer	1	0	0	0	0
13	Mechanic	0	0	1	0	0
14	CAD Expert	3	3	1	1	0
15	GIS Expert	1	0	1	0	0
16	Process Assistant	1	1	1	0	0
17	Irrigation Planning Expert	1	2	1	0	0
18	Documentation &Information Center Expert	1	1	1	1	0
	Total	39	23	24	15	7
	% from the plan	-	59%	-	63%	29%

Source: OWMEB

As pointed out in the recommendations of the terminal evaluation of the project, the institutional sustainability of OWMEB was crucial. Several organizational changes had been carried out since the project completion and there are some possibilities that

OWMEB might be changed to an independent authority in the near future like the former OIDA. The institutional sustainability of the headquarters should be considered very carefully.

3.4.3 Technical Aspects of the Implementing Agency

At the beginning of the project, there were no appropriate technical guidelines for the rehabilitation of gravity irrigation schemes and WHT, hence these were developed as part of the project by developing the capacity of counterparts. During this process, basic knowledge and skills to develop the irrigation of the region were accumulated and utilized by the counterparts.

According to interviews with Zone and Woreda offices during this evaluation, the guideline for rehabilitation of gravity irrigation schemes was utilized by the counterparts at Zone and Woreda levels rather than those at OWMEB headquarters. The fourteen-page guideline described the general flow of the rehabilitation process and had been utilized as a basic reference document. The guideline is suitable for determining the overall rehabilitation process and was not intended to be used by each process.

In addition, during the interviews, the counterparts of OWMEB mentioned the need to review and revise the WHT guideline based on the present conditions on the ground. For example, they were examining the feasibility of adding a new technology to flood diversion apart from existing technologies such as water ponds, tanks and shallow wells.

It was also identified that the number of guidelines distributed was limited and those already distributed were taken away by some staff who were transferred and resigned, leaving many staff unable to access the guidelines. Since new staff were unaware of the background to the project, they could not understand the contents of the guidelines very well if they only read them without lectures. Thus, new staff needed periodic training to understand the contents of the guidelines precisely.

The Project for Capacity Building in Irrigation Development, the successor to this project, includes plans to develop a design and construction manual for irrigation schemes, which describes the detailed methodologies and procedures for irrigation development from technical perspectives with references to existing guidelines.

3.4.4 Financial Aspects of the Implementing Agency

Even after the project completion, the Oromia regional government has been allocating funds for irrigation development. Table 20 shows the total budget of OWMEB from the project completion (2008) to the year in which the evaluation was conducted (2011). The total budget has tended to increase from 10 to 30% per year except 2010, so there seems to be no serious issue in terms of the financial sustainability of OWMEB.

Table 20: Total Budget of OWMEB

Unit: Ethiopian Birr

	2008	2009	2010	2011
Total budget	180,440,000.00	200,500,000.00	174,996,512.20	231,797,570.00

Source: OWMEB

Table 21 indicates the Oromia regional irrigation development plan (construction/ development) and its budget prepared by OWMEB. OWMEB gives balanced focuses and budget allocations for small-, medium- and large-scale irrigation development over the next three years, hence the level of financial sustainability for small-scale irrigation development seems high.

Table 21: Irrigation Development Plan in Oromia State (Construction/Development)

Scale	Details	Year			Sub-total
		2012	2013	2014	
Small	Number of projects	27	31	36	94
	Planned irrigated areas (ha)	3,240	3,740	4,320	11,300
	Number of beneficiaries	9,720	11,220	12,960	33,900
	Budget (sub-total, unit Birr)	97,200,000	112,200,000	129,600,000	339,000,000
Medi-um	Number of projects	8	10	4	22
	Planned irrigated areas (ha)	8,562	8,350	6,755	23,666
	Number of beneficiaries	25,686	25,049	20,264	70,998
	Budget (sub-total, unit Birr)	287,132,500	264,872,500	248,200,000	800,205,000
Large	Number of projects	2	2	1	5
	Planned irrigated areas (ha)	8,884	8,409	8,409	25,702
	Number of beneficiaries	26,652	25,227	25,227	77,106
	Budget (sub-total, unit Birr)	222,472,500	208,203,000	208,203,000	638,878,500
Total	Number of projects	37	43	41	121
	Planned irrigated areas (ha)	20,686	20,499	19,484	90,118
	Number of beneficiaries	62,058	61,496	58,451	270,354
	Budget (sub-total, unit Birr)	606,805,000	585,275,500	586,003,000	2,710,928,500

Source: OWMEB

3.4.5 Continuity of Effectiveness / Impact

The activities for gravity irrigation rehabilitation, pump irrigation, WHT, and farm operation training have continued but the sustainability of their impacts varies as shown in the evaluation results displayed in Tables 6, 7, 8, 9, and 15.

Based on the results of field observation and interviews with the WUA/WUC, the

impacts of gravity irrigation rehabilitation and pump irrigation are relatively high since cash crop productions in dry season have been expanding at the target areas of both activities. The positive factor boosting the sustainability of both activities is the fact that the operation, management, and rehabilitation of gravity irrigation scheme and pump irrigation have been performed using the in-house funds of the WUA/WUC. A small pump owned by the Badegosa WUA was not functioning when this evaluation was conducted, but repair of the pump had just finished at the workshop near the association. The repair charge was covered by the own funds of the association. During the repair of the pump, pump irrigation was continued by utilizing a personal pump owned by a member of the association.

(The pump provided by the project was repaired) (A pump owned by members was used while the pump was being repaired)

The Arata Chufa WUA became a successful model case in the Arsi Zone and was awarded “Best of UWC” from IFAD in December 2011. The association enhances the awareness of its membership through monthly meeting and the preparation of meeting minutes, preparation of data display for presentation (e.g. data on membership and irrigation farming plans), and active information sharing when participating in training activities. To disseminate the activities of the Arata Chufa WUA as a model case of Oromia state, OMWEB conducted a study visit to the association; aiming to exchange views and observe situations, as one of the activities of The Project for Capacity Building in Irrigation Development in February 2012.

It was very difficult to measure the success and failure of WHT activities. This was because 1) the continuation of activities varies from farmer to farmer based on their level of operation and management skills and financial status and 2) no continuous training and monitoring was performed by OWMEB.

Regarding the use of the guidelines developed under the project, the guideline for gravity irrigation schemes was widely used, even in other areas. The guidelines could be

used to an even greater extent if more copies were distributed among all government staff, including new ones and periodical training was conducted for the staff.

In summary, the sustainability of the project effects was fair since there was a slight problem with the institutional arrangements of OWMEB and the deployment of the counterpart staff.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project has helped improve water utilization technology in the target area in Ethiopia, where the people were dependent on traditional farming technology and rain-fed agriculture.

To summarize the evaluation results, the project was highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore, its relevance was high. Its effectiveness was also high, since the project outputs and objective were achieved. Despite concern that the level of groundwater would decline in areas where the massive introduction of small-scale pumps was encouraged, several positive impacts have been identified such as the diversification of crops and increase in double or triple cropping, including dry season. As far as the project inputs are concerned, the schedule for the dispatch of the Japanese experts should have been improved following the activity on the ground. In addition, the shortage and frequent turnover of counterpart personnel have adversely affected the activity schedule. However, in general, its efficiency was high since the project cost and cooperation period were as planned. Its sustainability was also fair, because the irrigation farming was continued by the Water Users' Cooperatives (WUC) and farmers, despite concern over the sustainability of the implementation structure due to the possibility of government structural reform.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

1) Recommendation 1: Establishment of a Website for Sharing References and Information

It is expected that an official website will be established by OWWEB for stakeholders to download results and products, including guidelines and related data. The guidelines, leaflets, and crop calendars were highly evaluated by Woreda officials. However, they are likely to have suffered from substandard distribution and vanished with the change of personnel. Henceforth, to revise and append for various purposes, it is expected that stakeholders will obtain digitalized versions as required.

2) Recommendation 2: Institutionalization of OWMEB Staff Training Using Guidelines

Since not only OWMEB head office but the zone and Woreda officials also change personnel frequently, training on the operation and maintenance of small-scale irrigation must be institutionalized, using guidelines for the new staff. There are fewer opportunities for Woreda staff to have training than the head office. It is expected to consider adding training budget to Woreda staff.

3) Recommendation 3: Measures for the multipurpose utilization of Irrigation facilities

During the initial stage of the project, the facilities were solely for irrigation. However, they are now often used for multiple purposes (drinking water for domestic animals, everyday water for cooking and washing).

Domestic animals and wildlife often break water channels and plastic sheets. It is necessary to create more water drinking outlets for domestic animals and set up a fence to avoid wildlife intrusion. These measures are also expected to be considered when revising guidelines.

4.3 Lessons Learned

1) Lessons Learned 1: Measures for Organizational Change

It is noted that frequent personnel transfer due to continuous organizational changes hampered and delayed project activities. Although the organizational changes could not be controlled by the project, it is expected that both the Japanese and Ethiopian sides will start preparation in advance when there is the potential for change, and quickly take over the duties when such change happens. For example, the present and new counterparts can organize a “transitional team” for a short period to collaborate and hand over all key items through OJT, field observation and compiling the required data and materials for project management, so that the new counterpart would be able to get up to speed efficiently.

2) Lessons Learned 2: Organizational Strengthening through awareness raising among WUC/WUA members

The project revealed that the WUC/WUA, which had high sustainability, had raised the awareness of members, including on their water rights via periodical meetings, sharing information and data on irrigation farming at their office and active participation in training. As a result, the rate of membership fees such as water and maintenance fees increased gradually and members could spend their own funds on repairing and purchasing pumps. Furthermore, all WUAs were upgraded to WUCs and they gained

access to external funding. They opened bank accounts and collectively invested in the Water Users' Union (WUU). In Ethiopia, where group activities have been encouraged through farmers' cooperatives, supported by the Bureau of Agriculture, it is essential to strengthen the organization via awareness raising activities and establish financial stability to sustain the project.

3) Lessons Learned 3: Clarification of Project Objective

At the project planning stage, the appropriate number of long-term experts was not dispatched since the level of targets for the project objective and outputs remained unclear. In addition, although the indicators of the project objective were revised during the Progress Review Mission, a gap remained between the project objective and indicators and it was difficult to measure the achievement of the objective via the indicators.

It is necessary to establish a project objective with a clear target and indicators which are objectively verifiable to manage the project efficiently and evaluate its performance appropriately.