

Country Name	The Project for Water Supply to Small Cities in Southern Part of Amhara Regional State
Federal Democratic Republic of Ethiopia	

I. Project Outline

Background	The access rate to safe water in Ethiopia was 44% (2010, UNICEF/WHO), which was lower than the Sub-Saharan average of 61%. The Universal Access Program (UAP) which was launched in 2005 aimed at reaching 100% of water supply rate by 2015 (100% in urban areas and 98% in rural areas). Amhara Regional State had the second largest population in Ethiopia where development of water supply facilities did not keep up with the increase in population.			
Objectives of the Project	To provide safe and stable water by constructing water supply facilities in small towns of the Amhara regional state and enhancing the operation and maintenance capacity			
Contents of the Project	1. Project Site: 9 sites in Amhara Region (Yetimen, Lumame, Wojel, Sedie, Dibo, Amanuel, Bikolo, Mertule Maryam, Gobeze Maryam) 2. Japanese side (1) Construction of water supply facilities with public faucet and rehabilitation of existing facilities (2) Technical assistance (soft-component) for the enhancement of operation and maintenance capacity of Water Management Organizations (WMO, currently replaced by Town Water Utilities; TWU) and Woreda Water Office (WVO) 3. Ethiopian side: - To acquire the water rights of the water source for the construction of water supply facilities, - To acquire the land for the water supply facilities, - To construct and maintain the access roads from public main roads to the construction sites, and others			
Project Period	E/N Date	June 10, 2013	Completion Date	June 13, 2015
	G/A Date	June 10, 2013		
Project Cost	E/N Grant Limit / G/A Grant Limit: : 633 million yen			Actual Grant Amount: 595 million yen
Executing Agency	Amhara Water, Irrigation and Energy Bureau, AWIEB (formerly Bureau of Water Resource Development of Amhara Regional State, AWRDB)			
Contracted Agencies	Main Contractor(s): TONE ENGINEERING CORPORATION Main Consultant(s): Kokusai Kogyo Co., Ltd. Agent: -			

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of Ethiopia at the Time of Ex-Ante and Ex-Post Evaluation></p> <p>The project has been consistent with the development policy of Ethiopia. At the time of ex-ante evaluation, the “Universal Access Program 2 (UAP2)” (2011) aimed at achieving 100% of water supply rate by 2015 (from 80 % to 100% in urban areas and from 35% to 98% in rural areas). At the time of ex-post evaluation, the national five-year strategic plan, the “Growth and Transformation Plan 2 (GTP-2)” (2015/16 - 2019/20) aimed to provide rural water supply access at the GTP-2 minimum service level of 25 L/day/person within a distance of 1 km from the water delivery point for 85% of the rural population.</p> <p><Consistency with the Development Needs of Ethiopia at the Time of Ex-Ante and Ex-Post Evaluation ></p> <p>The project has been consistent with the development needs of Ethiopia for water supply, especially in rural areas. At the time of ex-ante evaluation, the access rate to safe water was 44%, which was lower than the sub-Saharan average of 61%. At the time of ex-post evaluation, according to the Statistical Report for Amhara Region, the projected estimated population in Amhara Region in 2017 was 27.1 million: about 85.4% of the inhabitants living in the rural community, and 17% of the rural community used unprotected water sources, such as untreated river water (24%) and unprotected spring water (36%).</p> <p><Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation></p> <p>The project was consistent with the Japan’s ODA Policy to Ethiopia. Under the “Country Assistance Policy to Ethiopia (2012)”, rural water supply was prioritized under the priority areas of Agriculture/Rural Development.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>
2 Effectiveness/Impact
<p><Effectiveness></p> <p>The project achieved its objectives in terms of all indicators (Indicators 1 to 3) in the target year. The water coverage ratio (Indicator 1), however, decreased and became lower than the target criterion at the time of ex-post evaluation (2019). This is attributable to rapid population growth (17.5% average annual growth) in comparison with the increase in population served (10.1%) after 2016. TWUs explained that Ministry of Water, Irrigation and Energy (MoWIE) and AWIEB had provided full commitment to establish new TWUs for all towns (Indicator 3) and standardized the TWUs with clear town utility management guidelines. Therefore, the capacity of maintaining water supply facilities has increased.</p> <p>The structural appearance of the facilities has been generally good except in one town (Mertule Maryam), according to AWIEB. However, nearly half of the 95 public faucets have been out of function and unused in four surveyed sites. Two reasons for underutilization can be pointed out from the interviews; (1) decrease in water production from a constructed well and a developed spring which caused</p>

insufficient water supply to some public faucets (35 faucets in 2 sites), and (2) inadequate maintenance of damaged faucets, water pressure control boxes, and gate valves by TWUs because of undeveloped supply chains and poor stock of the spare parts, particularly high-cost items, due to limited budget (7 faucets in 2 sites). TWUs have had a plan to store some of low cost items at their offices for urgent maintenance activities.

<Impact>

According to the beneficiaries¹, positive impacts, such as decrease in the workload of fetching water, mortality of children from water-borne diseases and drop-out of children from schools have been reported. The respondents stated that the availability of water points at their nearby households and villages significantly reduced the workload of women and girls. This in turn enabled these women to spend more time for other productive activities. The households relied on the water (including drinking water) from the public faucets before the project. After the project, they get the water from the public or neighbor private faucets, and therefore the budget expenditure is not basically changed. The change in expenditure for water is small even if the individual water consumption increases, because the water tariff for the service is still low and affordable enough for their livelihood.

No negative impacts on surface environment have been observed, according to WWO and TWUs. However, there is a sign of negative impacts on the subsurface environment (groundwater). It was reported that water discharge from both some of the newly constructed wells and existing nearby wells had decreased. These phenomena indicate that groundwater may be at a risk of depletion.

There were some negative impacts caused by construction of the pipelines according to the interviews at 4 project sites in 2 towns. There were some claims from landowners to the constructed pipes, which pass through their land, and from the communities who were not able to be benefited from the pipes though they pass through the communities. The claims were successfully settled, because WWO applied the regional land use management and regulation guidelines to respond to most of the claims from the landowners and local communities. (For the latter case, TWU decided to build a new reservoir tank at their own cost and supplied the water to the communities.)

<Evaluation Result>

Therefore, the effectiveness/impact of the project is fair.

Quantitative Effects

	Baseline (2012) Baseline Year	Target (2016)	Actual (2015) Year of Completion	Actual (2016) Target year	Actual (2019) 3 years after Completion
Indicator 1: Water coverage ratio at 9 towns	23.0%	80.4%	81%	81%	66.6%
Indicator 2: Population of water coverage at target 9 towns	13,810 people	56,912 people	57,335 People	57,335 people	76,473 people
Indicator 3: Number of WMO (Now TWU) to be able to operate and maintain water supply facilities sustainable	0	9	8	9	9

Source: JICA documents, questionnaire survey and interviews with AWEIB, WWOs, and TWUs

3 Efficiency

Both the project cost and project period were within the plan (the ratio against the plan: 94%, 100%). The outputs were produced as planned. Therefore, the efficiency of the project is high.

4 Sustainability

<Institutional Aspect>

TWU at each site is responsible for operation and maintenance (O&M) of the facilities under the project with the support by the relevant WWO. TWUs reported that the staffing and institutional arrangement were enough to perform their roles and responsibility. At the time of the field survey under the ex-post evaluation, the water service was on the progress of standardization throughout the Region to meet the increasing demand. The number of personnel is expected to increase.

According to WWOs under Woreda administration, the current structures of both WWOs and TWUs have been sufficient and interactive enough to execute the basic O&M functions of the water services required for the current conditions of the towns. WWOs and TWUs usually cooperate with each other to solve O&M problems at their own capacities.

<Technical Aspect>

TWUs have had basic technical skills to operate and maintain most of the facilities. Senior operators and newly employed technicians (usually TVET - Technical and Vocational Education and Training graduates) acquired the techniques from the soft component (O&M training for the new facilities). However, technical capacity for specific maintenance has been insufficient. Although the senior operators has assisted the technicians to develop and upgrade their knowledge and skills for operating the pumps and generators, the engines of generators has been difficult to be fixed by their own technical skills without external or senior technicians who have advanced maintenance skills.

WWOs have had technical staff who supervises or assists TWU operators/technicians to repair the equipment and have had regular refreshment training such as basic generator maintenance, pipeline replacement, welding of pipes, and replacing gate valves, but the operators/technicians have not regularly applied precautions and monitoring of the equipment. There has been a lack of mechanisms that strictly manage and promote the supervising activities of WWO's technical staff to TWU's operators/technicians.

<Financial Aspect>

The revenue of TWUs has increased because of increase in water fee collection, while the expenditure has also increased mainly due to the cost for fuel (mainly diesel fuel for the generators). The maintenance cost (spare parts, etc.) has been significantly small in the expenditure. An abrupt increase in maintenance cost in 2018 was attributable to the purchase cost of a generator for replacement of the damaged one. There is a possibility of increase in maintenance cost as the water facilities expand and get older. As per the explanation of WWOs, most of the budget (the gap between the total revenue and expenditure in the table below) goes to construction of new boreholes, trainings for its staff and administrative costs (excluding salary). Although the total number of boreholes increased, the maintenance cost

¹ At the time of ex-post evaluation, 20 individuals (16 were women) in the selected four sample woredas were interviewed.

did not accordingly increase, this may imply insufficient engagement by WWOs in maintenance of the constructed facilities from a budgetary aspect.

Average Revenue and O&M Expenditure of TWUs*

(Unit: ETB)			
Items	2016	2017	2018
Total Revenue:	2,800,000	4,300,000	6,500,000
• Water fee (collected fee on consumption basis)	2,800,000	4,250,000	6,300,000
• Others (New connections)	-	50,000	200,000
Total Expenditure:	2,699,000	3,600,000	5,400,000
• Salary (all staff)	245,600	345,600	432,000
• Fuel (for generators, etc.)	2,400,000	3,000,000	3,600,000
• Maintenance (spare parts, etc.)	24,000	175,000	1,200,000
• Others (office supplies, etc.)	30,000	79,400	168,000
Balance	101,000	700,000	1,100,000

*Average of the four TWUs visited during the survey

Average Revenue and O&M Expenditure of WWOs**

(Unit: ETB)			
Items	2016	2017	2018
Total Revenue (for all WWO activities):	12,175,000	13,000,000	20,000,000
Expenditure (not all):	3,200,000	3,030,000	4,600,000
• Salary (all staff)	1,200,000	1,680,000	2,400,000
• Maintenance (spare parts, etc.)	1,700,000	1,150,000	1,500,000
• Others (office supplies, etc.)	300,000	500,000	700,000

**Average of the four WWOs visited during the survey

<Current Status of Operation and Maintenance>

As per the technical guideline provided in the project, TWUs have applied lower level maintenance for the facility such as changing of faucets, gate valves and pipes. WWOs have supported the TWUs by technical training and providing some maintenance services that are beyond the capacities of TWUs upon request from the TWUs. However, there was an evidence that a damaged generator was not able to be fixed even by the woreda level. From the survey result, the WWOs did not have routine monitoring practices. According to WWOs, one reason is that WWOs have focused on and allocated a large proportion of their budget to construction of new facilities. Another reason is indicated from the interviews to the WWOs that they hesitate monitoring because they do not have sufficient storage of expensive spare parts and are afraid of finding damages which need such spare parts.

According to TWUs and WWOs, there have not been enough procured spare parts at the stock of Region, Zone and Woreda. Commodity spare parts such as faucets and pipes and consumables are locally available and cheap enough for procurement by TWUs and WWOs. But spare parts for specific generator components are not locally available and are not affordable by the woreda office even if they are found in big cities.

<Evaluation Result>

Some problems have been observed in terms of the technical and financial aspects, therefore, the sustainability of the project effect is fair.

5 Summary of the Evaluation

The project achieved the objectives in terms of the indicators (water coverage ratio, population of water coverage, and number of TWUs) in the nine towns at the target year, but the water coverage ratio dropped after the target year as the population rapidly increased. All targeted TWUs have become able to operate and maintain the facilities except for repair of complex equipment such as generators that require specific technical skills. Positive impacts such as decrease in the workload of fetching the water and water-borne disease have been observed. As for the sustainability, problems have been observed in the technical and financial aspects, however, there has been no noticeable problem in the institutional aspect.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations to Executing Agency:

Maintenance activities have been weak due to insufficiency in technical skills, maintenance budget, stock of spare parts. There also seems to be a lack of WWO's commitment to encourage their daily inspection and monitoring to TWU's maintenance activities. Therefore, the following actions would be recommended.

- AWIEB searches and establishes the network for equipment repair (manufacturers' agencies, shops, technicians, etc.), or sends WWO's technical staff to advanced repair training courses (e.g., at Ethiopian Water Technology Institute - EWTI)
- AWIEB and WWOs allocate more budget to maintenance and subsidize it to TWUs.
- AWIEB searches and establishes supply chains by contacting makers, other regions, and institutions (e.g., EWTI) and shares the information with WWOs and TWUs.
- AWIEB establishes regular follow-up mechanisms (e.g., guidelines) by which WWO's technical staff are promoted to supervise TWU's daily inspection and monitoring procedure.

The maintenance budget mentioned in (b) above would be better to be considered at the time to plan the budget for the next fiscal year. Other recommendations would be taken immediately.

Lessons Learned for JICA:

- Consider carefully the impacts on the groundwater conditions for sustainable production of water: Some water supply wells constructed in this project did not yield groundwater as planned. Furthermore, operation of the newly constructed wells reduced the groundwater production rates at some existing neighbor wells. These phenomena clearly indicate overestimation of groundwater production in this project and a potential risk to depletion of groundwater resource in the region, which may cause water conflicts. A similar future project would need to put a more premium on the impacts to the subsurface environment (groundwater conditions). The preliminary field survey should focus on not only water production but also drawdowns (changes in groundwater head) during pumping tests, which indicate the sustainability of groundwater resource and the impacts on other users of the resource. The project requires careful consideration of the regional groundwater balance and should be planned with a viewpoint of comprehensive water

resources management. As a result of these in-depth preliminary studies, it may be concluded, for example, that the project requires an enhanced groundwater recharge (water harvesting) to sustain the groundwater production at design rates while maintaining the groundwater reserve.

- Consider carefully the communities affected by the construction and operation of the planned facilities: It would be better to consider that communities affected by the construction and operation of the water facilities are included as beneficiaries of the project to avoid any conflict and sabotage against the project by the communities.
- Consider alternative sources of energy (power supply) to operate the facilities: Most of the operational cost goes to diesel fuel for generators. To reduce this operational cost and to increase the maintenance budget on the other hand, another energy source such as PV (photovoltaic) power would be better to be studied at the design phase. Although such an energy source may increase the initial (construction) cost, it is expected to significantly reduce the operational cost and enhance the sustainability of the project.



Water reservoirs (left: existing, right: newly constructed in this project, behind: newly constructed by TWU for the use by an additional community)



Public faucets abandoned because of no groundwater produced