

Ethiopia

Ex-Post Evaluation of Grant Aid Project

“The Project for Water Supply in Southern Nations, Nationalities and Peoples’ Regional State”

External Evaluator: Yumiko Nakamura, Binko International Ltd.

0. Summary

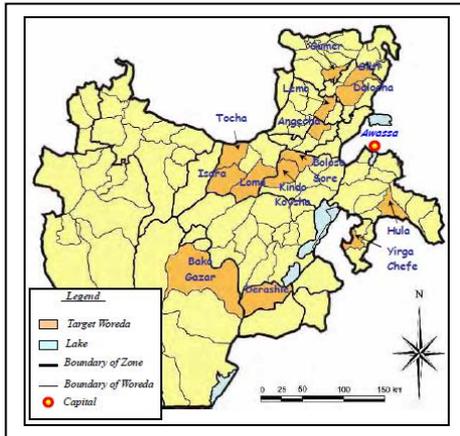
This project aims to provide the residents of 106 villages in 14 woredas¹ of 10 zones in Southern Nations, Nationalities and Peoples’ Regional State (SNNPRS hereafter) with access to safe drinking water. The project constructed water facilities and set up Water and Sanitation and Hygiene Committees (WASHCOs hereafter) in order to continuously run and maintain those water facilities². The objective of this project is highly relevant to the country’s development policy, development needs, as well as the ODA policy that Japan upholds. The percentage of people provided with water access by the project remains at 61% of the target value because the functioning rate of water facilities was 66%. However, the intended effects in the project are observed such as that water facility users noted that water related diseases had decreased and opportunities to effectively utilize time for daily activities had increased by reduced water-fetching workload. Thus the effectiveness and impact of the project are fair. The project cost was lower than planned; yet the project period exceeded the plan due to ethnic conflicts, and roadblocks caused by landslides and the washout of roads used for transporting equipment. Thus the efficiency of the project was fair. With regards to the operation and maintenance of facilities, 66% of the constructed facilities by the project are now functioning while the staffing, maintenance skills and financial capacity of Woreda Water Desks, which play central roles in maintenance, have room for improvement. Thus the sustainability of the project effect was judged to be fair.

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

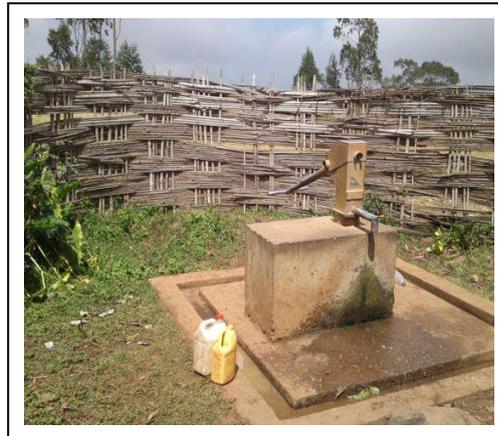
¹ Woreda is the third-level administrative divisions of Ethiopia and is positioned as district.

² At the time of ex-post evaluation, target woredas increased to 25 along with the jurisdiction change.

1. Project Description



Project location



A water facility provided by the project

1.1 Background

Ethiopia is located at the center of the Horn of Africa and is the second largest country in terms of population (approx. 85 million) in Sub-Saharan Africa. The country covers 1,104,000 square kilometers of land and is a landlocked state sharing borders with Eritrea, Djibouti, Somalia, Kenya and Sudan. The seasons are divided into a light rainy season (February to May), a heavy rainy season (June to September) and a dry season (October to January). The source of the Nile lies in the northern half of the national soil and thus makes Ethiopia an important country in considering the water resource management of the Northeastern African continent. However, water shortages due to the massive drought that hit the country recently left serious damage in its society and economy. Moreover, due to delays in water facilities construction, the water supply coverage was 23%, which was quite lower than the 54% of the Sub-Saharan average. Such situation made local residents unavoidable to use rivers and spring water as their primary water sources. As a result, there were frequent outbreaks of water-related diseases.

In response to this situation, the government of Ethiopia developed the Second Five-Year National Development Plan (2000-2005) in 2000 and the Sustainable Development Poverty Reduction Program (SDPRP hereafter) in 2002 in which they identified the water sector to be one of their priorities. The Water Sector Development Program (WSDP hereafter) (2002-2016) developed in 2002 also prioritized water resource development in order to achieve poverty reduction and sustainable development. It suggested that beneficiaries should have a responsibility for sustainable operation and maintenance of water facilities as well as water supply development. Further, the Water Supply and Sanitation Development Program (WSSDP hereafter) in the WSDP prescribed that village water supply coverage is to increase from 23.1% in 2001 to 70.9% in 2015 at the national level. The National Water Supply and Sanitation Master Plan that was developed in January 2003 suggested the necessity of securing financial resources, woreda and region personnel at implementing agencies and their capacity building in

order to achieve the WSSDP goals.

Given this background, the government of Ethiopia requested grant aid from Japan for the SNNPRS where existing water facilities showed low functioning rates in order to tackle the shortage of water facilities in rural villages as Japan has long been contributing to groundwater development projects in Ethiopia including the Groundwater Development and Water Supply Training Project, which was a technical assistance project implemented from 1998 to 2005.

1.2 Project Outline

The objective of this project is to increase served population with safe and stable drinking water supply in 106 villages in 25 woredas in 10 zones of the SNNPRS by procuring drilling machines, constructing water facilities, and establishing user organizations to continuously operate and maintain the facilities.

Grant Limit/Actual Grant Amount	1,061million yen / 810 million yen
Exchange of Notes Date	Term 1/2: June 20, 2005 Term 2/2: June 23, 2006
Implementing Agency	SNNPRS Water Resource Development Bureau
Project Completion Date	Term 1/2: March 13, 2007 Term 2/2: July 17, 2008
Main Contractors	Term 1/2: Toa-Tone Boring Co., Ltd. Term 2/2: Marubeni and Urban Tone Consortium
Main Consultant	Term 1/2, Term 2/2: Nippon Koei Co., Ltd.
Basic Design	October 6, 2004 - March 18, 2005
Detailed Design	N/A
Related Projects	<p>Technical Assistance:</p> <p>“Groundwater Development and Water Supply Training Project”, (JICA, 1998-2005)</p> <p>“The Water Sector Capacity Development Project in SNNPRS” , (JICA, 2007-2011)</p> <p>Projects by other agencies:</p> <p>“Master Plan of Operation, Water and Environmental Sanitation” (UNICEF, 2002-2006)</p> <p>“Water Supply and Sanitation project” (World Bank, 2004-2009)</p>

2. Outline of the Evaluation Study

2.1 External Evaluator

Yumiko Nakamura, Binko International Ltd.

2.2 Duration of Evaluation Study

The ex-post evaluation was done in the following durations.

Duration of the Study: October, 2012 – August, 2013

Duration of the Field Study: February 2 – 22, 2013 and June 9 – 16, 2013

2.3 Constraints during the Evaluation Study

229 water facilities were constructed in 10 zones of SNNPRS in this project. However, the ex-post evaluation could not check the operation and maintenance situation of all water facilities that were expected to be covered in the evaluation due to the constraints on field study period and budget. The study could not survey all 25 Woreda Water Desks, either.

3. Results of the Evaluation (Overall Rating: C³)

3.1 Relevance (Rating: ③⁴)

3.1.1 Relevance with the Development Plan of Ethiopia

The Poverty Reduction Strategy Paper (PRSP) at the time of the Basic Design Study (BD Study hereafter) was the SDPRP (March 2002 to May 2004) developed in 2002. It set the strategy by identifying water resources, village agricultural development and food security as core sectors for attaining poverty reduction. The SDPRP prescribed the target value of the water supply coverage at the village level of 31.4% be achieved by 2005. WSDP (2002-2016) in 2002 also put emphasis on the importance of water resource development for poverty reduction and sustainable development, and suggested imposing an appropriate level of contribution on beneficiaries to actualize sustainable water supply development and maintenance. Further, WSSDP in the WSDP set the target value of village water supply coverage in SNNPRS at 68% being achieved by 2016.

Even at the time of ex-post evaluation, importance of water resource development for the purpose of achieving MDGs and poverty reduction was identified in Ethiopia's national development plan (PASDEP⁵ hereafter) (2005-2010) and "strengthening the infrastructure backbone" was highlighted as one of the eight priorities. In strengthening basic infrastructure, the PASDEP targeted increasing water supply coverage in both urban and rural areas and

³ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁴ ③: High, ②: Fair, ①: Low

⁵ PRSP: Plan for Accelerated and Sustained Development to End Poverty

reducing nonfunctioning water facilities in rural areas from 30% (2005) to 10% (2010). In addition, the Growth and Transformation Plan (GTP) (2010-2015), which was a new five-year development plan created in 2010, set out seven strategies. Among them, a safe drinking water supply was considered to be essential for improving socioeconomic development, standards of living and poverty reduction, and was positioned as one of the priorities in strengthening infrastructure development. Further, the revised Universal Access Plan (UAP) (2011), which is the country's five-year water sector development plan, set forth human resource development and capacity building at a woreda level as well as introducing water facilities that allow low-cost operation as a critical strategy.

Thus, the project which consists of construction of water facilities and a soft component program that was implemented for the purpose of developing and strengthening human resources in the water sector has contributed to increase in access to safe drinking water. Thus, both ex-ante and ex-post evaluations found that the project has been highly relevant to the development policies of Ethiopia.

3.1.2 Relevance with the Development Needs of Ethiopia

At the time of the BD Study, the country's water supply coverage was 24% on average, which was quite lower than the Sub-Saharan average of 54%. Water supply coverage in SNNPRS during the same period was as low as the national average at 24%, and therefore development of water facilities was urgently required. More than 80% of the SNNPRS residents used rivers and spring water as their primary domestic water source and as a result, outbreaks of water related disease became frequent including diarrhea, dysentery, typhoid and cholera. Furthermore, annual drought caused water shortages and left a serious impact on the society and economy of Ethiopia. This situation made the improvement of the living environment through developing and promoting sanitary water facilities an urgent issue.

The rural water supply coverage in SNNPRS was 58.7% in 2010 when the ex-post evaluation was conducted. This was lower than the average national water supply coverage in rural areas of 65.8%⁶. Among 25 woredas in the project sites, 11 woredas that were examined in this study showed 38.3% water supply coverage on average, which was 20% lower than the regional average. Further, the 2001 Demographic Health Survey showed 16.4% diarrhea prevalence among children (under five years old), which remained to be higher than the national average of 13.4%. Thus, the development needs for improving water access in SNNPRS that was targeted by the project were high.

⁶ Source: UAP (2001)

3.1.3 Relevance with Japan's ODA Policy

Japan's ODA policy to Ethiopia (2005) took priorities for a poverty reduction strategy into consideration and identified food security and agricultural development, water resource development and management, education and capacity building, health and HIV/AIDS and economic infrastructure as aid priorities. The draft of work plan that was published in the process of County Assistance Planning in 2005 also emphasizes that water resource development was closely connected to poverty reduction and food security in Ethiopia and its surrounding countries along with human resource development, health improvement, and transportation and communication infrastructure development.

In addition, this project was implemented based on the Japanese Prime Minister's announcement of "doubling aid to Africa in three years" made at the International Conference on African Development in April 2005. Thus it was coherent with Japan's ODA policy at the time of planning.

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

3.2 Effectiveness⁷ (Rating: ②)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

The actual number of people who were newly served with water through this project was 54,038 in 2013. The achievement rate is 61%. The number of project beneficiaries that was intended as the 2013 target at the time of BD Study was 90,389 and the number of people who were served with water at four sites where the functionality of facilities was not confirmed in this study was 1,400. The balance, 88,989, equals 61% of the originally intended target of 90,389 (Table 1)⁸.

The actual number being lower than the target was caused by the following reasons: nine hand pump shallow wells and two spring water facilities were not constructed, one hand pump facility in Dalocha Woreda was destroyed due to trouble with a neighboring village, and nonfunctioning water facilities reduced the number of people with access to water⁹. Major causes of breakdown included broken hand pump chains and deterioration of PVC pipes.

⁷ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁸ Calculation is done by deducting the intended number of people who are newly served with water in four sites (1,400) from the target number as data on functionality was not available from the four sites at the time of ex-post evaluation. Based on the actual number of constructed facilities, the actual number of people with access to water in 2013 is 63% of the intended value.

⁹ The rate is calculated based on the number of functioning facilities at the time of the ex-post evaluation. The facilities are judged to be "functioning" when water was successfully pumped up when our surveyor visited the water facility that was provided by the project. It must be noted that the functionality here is defined differently from the UAP definition that nonfunctioning facilities are the ones that do not function for at least two to three weeks a year.

Table 1: The number of constructed facilities, their functioning rate and the population newly served with water as a result of this project (2013)

Type of water facility	Target value		Actual value (2008)		Actual value (2013)	
	Number of facilities	Intended population served with water ¹⁰	Number of facilities	Population newly served with water	Number of Functioning (Functioning rate)	Population newly served with water
Hand pumped shallow well	214	74,900	205	71,750	134/201 (67%)	46,900
Spring water facility	26	15,489	24	13,404	15/24 (63%)	7,138
Total	240	90,389	229	85,154	149/225 (66%)	54,038

Source: Target value: BD Study Report (2005), Actual value (2008): Documents provided by JICA, Actual value (2013): Results of the ex-post evaluation study (2013)

Well drilling at the project sites was done by two drilling machines that were procured by this project in addition to other preexisting drilling machines and that left a positive impact on achieving the project goal.

Field studies found that the machines were still in regular use even after the project had finished. However, the average number of drilled wells was 14 for the past six years, which was significantly lower than the 60 wells per year on average that was originally targeted. Interviews with Southern Water Works Construction Enterprise (SWWCE hereafter) during the ex-post evaluation study found that one of the reasons for not meeting the target was that a machine was overturned and its engine destroyed. Other possible reasons would be that well drilling done by SWWCE between 2007 and 2008 was only eight cases. Based on these reasons, while machine procurement showed some contribution to the project target, its role in achieving the region-wide water supply coverage target was extremely limited.

One of the targets in this project was for WASHCOs to start collecting a tariff in all villages. This was implemented as originally planned.

3.2.2 Qualitative Effects

(1) Safe water supply

The primary water sources that residents used before the construction of water facilities in this project were creeks and rivers. According to the results of BD study, more than half of the residents using those sources answered that the water quality was not good¹¹. The survey conducted among 99 beneficiary households during the study also found that the major water sources were “creeks and rivers” and “spring water” before water facilities were constructed. Although some households were still using these sources at the time of ex-post evaluation, users

¹⁰ The 2013 target was re-calculated based on population baseline data and the population growth rate of each village because the BD Study Report (2005) showed the 2014 target.

¹¹ Source: BD Study Report (2005)

of borehole facilities developed by this project were the overwhelming majority¹².

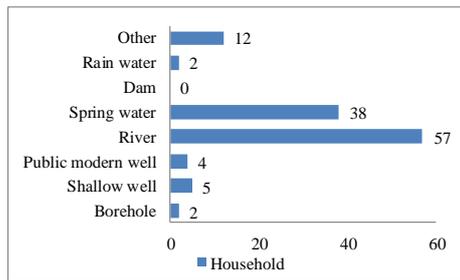


Figure 1: Former water source (n=99 households)
Source: The beneficiary survey results

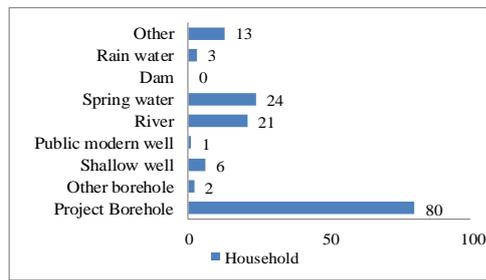


Figure 2: Present water source (n=99 households)

Among the 80 households that used the water facilities provided by this project, 85% (68/80 households) were satisfied with the smell of the water, 96% (77/80) with the color and 86% (69/80) with the taste (Figure 3). The facility survey performed during the study found that 10 out of 30 facilities (33%) were nonfunctioning and over 15 facilities out of 20 facilities (75%) showed no problems about smell, color and taste in their water (Figure 4).

Based on the facts above, the effectiveness of this project was maintained at the time of ex-post evaluation.

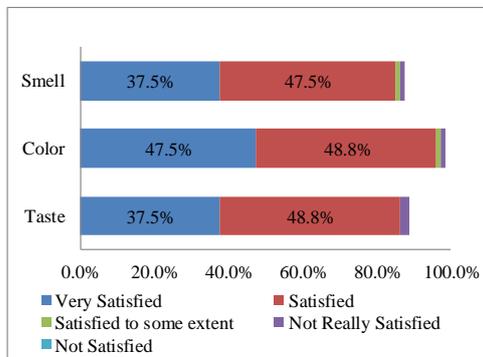


Figure 3: Residents' feedback on water quality (n=89 households)
Source: The beneficiary survey results

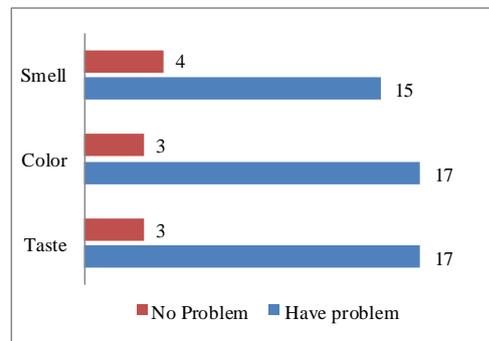


Figure 4: Results of facility survey (n=20 facilities excluding 10 nonfunctioning ones)

(2) Community-based facility maintenance system

Along with the facility construction, the project implemented a soft component program with an aim to organize community-based water users associations and to establish and continue facility maintenance systems. Awareness raising activities for residents and training on

¹² The beneficiary survey targeted 107 households in 21 villages in 12 woredas in 9 zones that are extracted from 106 villages in 25 woredas in 10 zones considering their access condition and survey schedule. However, the local Woreda Water Desk told after the study that eight households in different districts were included in this group. So, these households were excluded from the sample and finalized the number as 99 households.

monitoring capacity building for staff members of Woreda Water Desks were also given as part of this soft component program.

The study found that 14 out of the 21 targeted WASHCOs were managing functioning facilities and that 11 WASHCOs (about 80%) were engaged in daily facility inspection and continuously held meetings with residents to discuss their emergency responses and facility maintenance¹³. WASHCOs also collect water tariff from user households adopting either fixed-rate (13/14 WASHCOs) or a metered rate (1/14) systems (see 3.5.3 “Financial Aspects of Operation and Maintenance” for financial situations of WASHCOs). In addition, most of the households (76/80) that used the water facilities provided by the project responded, “water facilities are owned by communities”. Such a strong sense of ownership among residents had positive impact on routine maintenance. The result of beneficiary survey showed that 61 out of 80 households (76%) responded that they were engaged in activities to “keep cattle away from facilities,” 59 households (74%) were engaged in “mowing” and 54 households (68%) were engaged in “cleaning facilities”. For example, in Angacha, one of the studied areas, a local WASHCO and residents are farming together to use the revenue from farming to pay for the maintenance of water facilities. Hence, participatory facility maintenance becomes more common at a community level.

On the other hand, among 18 WASHCOs that answered a question on a six month monitoring visit by the local government, 10 WASHCOs (56%) answered “being monitored”, and the other eight WASHCOs (44%) did not show any record of Woreda Water Desks monitoring¹⁴. A questionnaire survey among Woreda Water Desks presented similar results. Among 12 Woreda Water Desks that responded to the survey, eight Desks (67%) “monitored WASHCO’s activity in the past six months” and four Desks (33%) had “never performed monitoring”¹⁵. The reasons for not being able to perform regular monitoring were staff shortages, a lack of modes of transportation and activity budget, and problems with site locations¹⁶.

Although ensuring the regular monitoring of Woreda Water Desks was expected as a result of implementation of the soft component program, it has only partially been established as only eight out of 12 Desks showed that monitoring was actually done.

¹³ WASHCO is a community organization responsible for water supply. 6 out of 14 WASHCOs (43%) are holding regular meetings while the rest (8/14 WASHCOs, 57%) hold meetings when necessary (based on the beneficiary survey results).

¹⁴ Among them, five WASHCOs (28%) are regularly monitored and the rest five WASHCOs (28%) are irregularly monitored, according to their answers (Source: The beneficiary survey results).

¹⁵ These eight woredas include five woredas that were targeted under the technical assistance project, the “Water Sector Capacity Development Project in Southern Nations, Nationalities and People's Region (WAS-CAP)” that was conducted along with this project in 2007. Of the eight Woreda Water Desks that answered that they are monitoring, seven Desks answered , “regularly” and one Desk answered, “irregularly.” (Source: The beneficiary survey results).

¹⁶ Source: Interviews with Woreda Water Desks

3.3 Impact

3.3.1 Intended Impacts

(1) Reducing water-related diseases¹⁷

The results of the beneficiary survey conducted at the time of ex-post evaluation showed that most of the project facility users among 80 households responded, “patients with water-related diseases have decreased” and about half said, “infant mortality and mortality of children under five years old have decreased.” The beneficiary survey conducted among 21 villages in 11 woredas during the ex-post evaluation found that diarrhea actually represented only 3% of the total population (Table 2) even though its rate was the highest in the previous two weeks compared with that of other water-related diseases.

Table 2: Water-related disease rates in the previous two weeks in 21 target villages (2003)

	Disease	Children (person)	Adults (person)	Total number of people infected (person)	Percentage in total (577)
1	Diarrhea	8	10	18	3%
2	Malaria	7	7	14	2%
3	Eye disease	3	0	3	1%

Source: The beneficiary survey results

The background for this decrease in water-related diseases in the target villages includes water quality improvement and awareness raising among people on a causal relationship between water and disease. First of all, residents used to use “creeks /rivers” or “spring water” as their primary water sources before the project while they used water facilities as their primary water sources after the construction. Therefore, improving access to safe drinking water led to a decrease in water-related diseases in the project area. Secondly, most of the 75 households (72/75, 96%) that responded to a question on people’s awareness of the causal relationship between water and disease understood the relationship. This is a significant improvement compared with 47.5% at the time of BD Study.

Based on the facts above, this project not only increased the number of people with access to safe water, but also raised awareness among resident on diseases, which eventually reduced overall water-related diseases. This is one of the outcomes of the activities by the soft component program implemented as part of this project.

¹⁷ The BD Study Report does not mention the pre-project data on water-related disease rates in the project area and thus comparisons with the data obtained from the ex-post evaluation study are impossible. A questionnaire among the agencies involved in facility maintenance (Water Resource Development Bureau, SWWCE, Woreda Water Desks, and WASHCO) and a beneficiary survey with villagers were conducted as part of the ex-post evaluation study.

(2) Increased opportunities to effectively utilize time for daily activities by reducing water-fetching workload

The BD Study expected to create opportunities for women and girls to advance in their society and work, and for children to have more time for study as a result of reduction of their workload by the construction of water facilities¹⁸. The study found that fetching water was predominantly a woman’s job in 59 out of 80 households (74%) that used the water facilities provided by this project. Figure 5 shows that the frequency and amount of fetching water increased after the construction in most of the households. On the other hand, the time required for one fetching trip (both ways) was reduced from 93 minutes to 55 minutes on average after the construction.

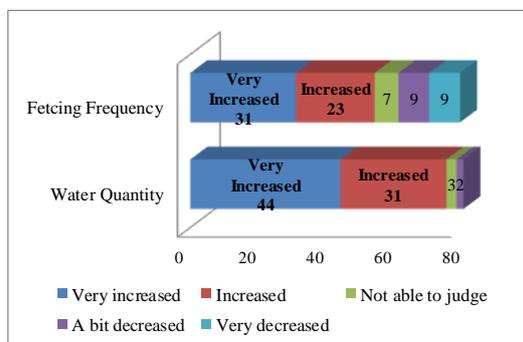


Figure 5: Change in frequency and amount of fetching water (n=80)

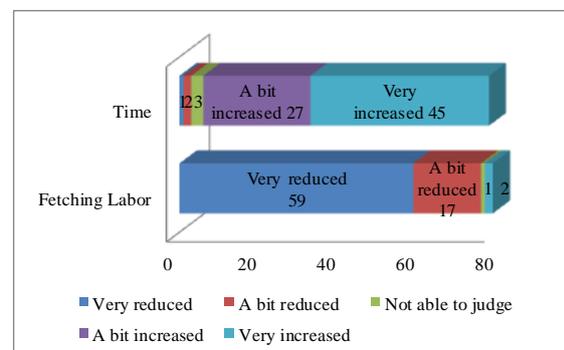


Figure 6: Change in time for daily activities and burden of fetching water (n=80)

Source: The beneficiary survey results

While the increases in water usage and frequency of fetching water could have led to an increase in fetching time per day, most of the 80 households that used the facilities provided by this project said, “fetching labor was reduced” and by which “time for housework has increased.” Residents thought their water-fetching workload was reduced because the burden of fetching water at the water sources as well as the distance and time required for fetching water were reduced. Interviews with residents found that they had to travel several kilometers to a water source before the project, and the fetching water at the water sources also took even more time¹⁹. Constructing foot-pump water facilities relatively close to their residence not only shortened distance and time required for carrying water, but also made water-fetching workload at the water sources easier. These two reasons explain why the residents felt their water-fetching workload was reduced.

The beneficiary survey results showed that 61 out of 80 households (76%) were engaged in

¹⁸ Source: BD Study Report (2005)

¹⁹ Source: Results of interviews with residents during the beneficiary survey

income generating activities such as farming and handicrafts by using their free time. They also spent more time on childcare, cooking, laundry and study, and half of the target households (42/61 households, 69%) said, their “income increased after the construction of the water facilities.”

Therefore, the project contributed to increased opportunities for facility users to effectively utilize time for daily activities²⁰.

3.3.2 Other Impacts

(1) Impacts on the natural environment

The survey results showed that most of the WASHCOs (20/21 WASHCOs) said, “there was no soil erosion, land degradation, or water deterioration by the project even after construction of water facilities were completed”²¹. Field studies found no serious environmental impact, either.

(2) Land Acquisition and Resettlement

There was neither land acquisition nor resettlement involved in this project. The land used for the construction of water facilities was donated by the local community. Therefore, no positive or negative impact was observed in terms of land acquisition or resettlement.

(3) Unintended Positive/Negative Impact

No other positive or negative indirect effects were observed.

This project has somewhat achieved its objectives, therefore its effectiveness is fair.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

(1) Machine and equipment procurement

Machines were procured as intended (Table 3).

²⁰ Women were responsible for fetching water in 59 out of 80 households that used the water facilities provided by the project. Most of them (57/59 households, 96%) were aware that labor involved in fetching water was reduced after the project and about 80% (46/59) were engaged in income generation activities. However, the impact of this project on women’s social advancement cannot be determined due to the lack of baseline data during BD Study.

²¹ The other WASHCO in Derashe said, “soil erosion was observed.” This means a landslide occurred during the construction process which was not directly caused by it (Source: Interviews with WASHCO).

Table 3: Machines and equipment procured by this project

Machines and equipment	Intended number	Actual (Term 1)	Actual (Term 2)	Actual (Total)
Truck mounted top drive rotary drilling rigs	2units	1unit	1unit	2units
Truck mounted high pressure air compressors	2units	1unit	1unit	2units
Cargo trucks	2units	1unit	1unit	2units
Cargo trucks with cranes	2units	1unit	1unit	2unit
Dump trucks	2units	1unit	1unit	2unit
Equipment for well drilling (Accessories and tools) ²²	2 ²³ sets	1set	1set	2sets
Electric logging equipment	1unit	1unit	0unit	1unit
Handy incubators	2units	2units	0unit	2unit
Microbiological testing kits	1set	1set	0	1set

Source: Documents provided by JICA

(2) Construction of water facilities

The project provided 205 hand pump shallow wells and 24 spring water facilities in 106 target villages in 25 woredas in 10 zones (Table 4). The numbers were lower than those in the BD Study by nine for hand pump shallow wells and two for spring water facilities.

Table 4: The number of facilities constructed in the project

(comparison between planned and actual) (Unit: site)

FY	2005	2007/2008
Type of water facility	Construction plan	Actual number constructed
Hand pump shallow wells	214	205
Spring water facilities	26	24
Total	240	229
Difference	—	-11

Source: BD Study Report (2005), Documents provided by JICA

The actual number of constructed hand pump shallow wells in this project decreased because the project cost went up between the time of E/N and the Detailed Design Study due to exchange rate fluctuation. On the other hand, spring water facilities decreased because construction was terminated at two villages as well as at their alternative sites in Derashe Special Woreda where an ethnic conflict occurred in the Term 2/2 period²⁴. Hence, the actual number of constructed spring water facilities decreased due to an unpredictable conflict between ethnic groups, and the decrease was unavoidable.

(3) Soft Component Program

²² “Accessories” are accessories for drilling rigs and “tools” include casing tools and fishing tools (Source: Documents provided by JICA).

²³ It was planned to purchase spare parts required for two years for the purpose of smooth operation of purchased machines (Source: BD Study Report (2005)).

²⁴ At the two target villages in Derashe Special Woreda, construction sites were changed due to an ethnic conflict during the construction process. Construction was also terminated at the alternative sites that were set up afterward because it was difficult to establish resident-oriented maintenance systems (Source: Documents provided by JICA).

Awareness-raising activities among residents and training for Woreda Water Desks and WASHCO staff were provided based on the plan of the soft component program in this project. However, the goal was not set out in planning and it was impossible to judge the outcomes of these activities or the efficiency in implementing the project, other than the establishment of WASHCOs in all of the 106 villages.

3.4.2 Project Inputs

3.4.2.1 Project Cost

With regard to the cost incurred to Japan with this project, the E/N grant limit was 1,061 million yen (517 million yen for Term 1/2 and 544 million yen for Term 2/2), yet the actual grant amount was 811 million yen (399 million yen for Term 1/2 and 412 million yen for Term 2/2) which was lower than planned (76% of the planned amount). The reduction is explained by the decreased output and the large balance left over (245 million yen) after bidding. Other than the balance, the actual output was reduced because the construction of nine hand pump facilities (11 million yen) was cancelled in order to offset the overspending in the project cost caused by an exchange rate fluctuation during Term 1. It was also because the construction of two spring water facilities (4 million yen) was terminated due to the armed fight in the project sites in Term 2. The reduction was 15 million yen in total²⁵.

Taking this reduced output into consideration, the project cost was lower than planned. Therefore, the efficiency of the project was high.

As for the cost incurred on the Ethiopian side, it was planned to be 193,000 Birr (2.5 million yen) to cover construction management, training expenses for Woreda and citizen trainees, establishment and operation of water users associations, instruction on maintenance, and securing personnel²⁶. Yet, the actual cost was higher than planned, and was 287,000 Birr (3.4 million yen).

3.4.2.2 Project Period

The project was planned to be 30 months long. It actually took 37 months (123% of the planned duration) and was slightly longer than planned. Two major factors caused to the prolonged project period. First, flash flooding in June 2007, which was six months before the project completion, washed out roads and caused landslides in Loma Woreda, Dawero Zone

²⁵ 11 million yen consists of: the drilling of nine wells (8,517,000 yen) + hand pump installation (1,959,999 yen) + transportation packaging (177,000 yen) + general management (876,000 yen). Construction cost (4 million yen) after the termination of two spring water facilities was calculated based on direct construction cost (3,189,000 yen) + shared temporary building and site management (608,000 yen) + general management (220,000 yen) (Source: Documents provided by JICA).

²⁶ Participation costs required for trainings and workshops of the soft component program held in the capital city of SNNPRS, Awasa included transportation, per diem allowance and accommodation (Source: Documents provided by JICA).

where the project was scheduled. This blocked machine transportation and traffic. Although roads were repaired in the Woreda after the rainy season, drilling had to be postponed until the road repair was completed and as a result, the construction was not completed until June 2008.

Secondly, an ethnic conflict occurred in November 2007 near the site where drilling was planned in Derashe Special Woreda. This conflict resulted in prohibition of entry into the site for three months until the end of February 2008, which also contributed to the prolongation. Even after the conflict calmed down, it was not completely finished and alternative sites were chosen. However, surrounding villages did not agree to the facility construction at the alternative sites and the plan was finally terminated in April 2008, and it took another three months to complete the official procedure to terminate²⁷.

Although the project cost was lower than planned, the project period was slightly longer than planned; therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

(1) Roles of involved agencies

Stakeholders in the maintenance of the water facilities provided by the project are the Water Resource Development Bureau, Zone Water Desks, Woreda Water Desks, WASHCOs and SWWCE. Their roles are listed in Table 5.

Table 5: Roles of stakeholders and their major responsibilities in facility maintenance (2013)

Agencies (role)	Major responsibilities
Water Resource Development Bureau (Superintendent of water facility maintenance in the region)	Coordinating zones and woredas, repairing on a mass scale ²⁸
Zone Water Desk (Superintendent of water facility maintenance in their jurisdictional zone)	Requesting regions to take care of repairs that cannot be done by zones, supporting woredas to supply spare parts, providing consultation services for repairs or new projects by woredas, applying for budget.
Woreda Water Desk (Superintendent of water facility maintenance in their jurisdictional woreda)	Repairing facilities, water quality testing, monitoring WASHCO activities, providing training and technical advice.
WASHCO (Practitioner of water facility maintenance)	Monitoring residents' activities, providing training for residents, collecting water tariff, basic repairing and maintenance of facilities, procuring parts.
SWWCE (Practitioner of drilling machine maintenance)	Maintenance of drilling machines (inspection, repair, and maintenance)

(This table was created by the evaluator based on the beneficiary survey.)

²⁷ Source: Documents provided by JICA

²⁸ Roles other than maintenance include water quality testing at the time of construction, contracting large scale facility construction (planning, preparing for bidding) and urban water supply projects.

(2) Roles of each stakeholder and staff allocation

1) Water Resource Development Bureau

The plan specified their major roles to be supplying staff to Woreda Water Desks, purchasing spare parts for hand pumps and helping transportation to zone/woreda. However, in recent years, a parts procurement network has been developed and the task to purchase spare parts that was originally the region's responsibility shifted to WASHCOs. This consolidated the current roles of the Bureau to ① coordination at the zone and woreda levels and ② large-scale repair of water facilities (Table 5)²⁹. On the other hand, staff allocation within the Bureau recently went through reorganization as a result of merger of the Ministry of Water and the Ministry of Mines and Energy, and the number increased from the intended 64 to an actual 76. Interviews with the Bureau did not find any staff shortage and thus a sufficient level of staffing to pursue their roles was attained in the Bureau.

2) Zone Water Desk

The roles of Zone Water Desks included coordinating regions and woredas, obtaining spare parts from regions upon woredas' requests and helping transport the parts to woredas. Their authority was meant to be gradually downsized during the BD Study conducted in 2005. While there was no change in the coordination between regions and woredas at the time of this study, new responsibilities were added including facility repair, consultation work on new facility constructions and budget requests³⁰.

3) Woreda Water Desk

The plan specified their major roles to be patrolling villages to provide instruction on WASHCO operations, raising awareness on hygiene and other issues, repairing and inspecting hand pumps and spring water facilities, testing water quality, requesting spare parts replacement (region/zone) and storing and supplying spare parts. The only change since the original plan was that WASHCO was responsible for spare parts procurement at the time of this study.

When the staff allocation at six interviewed Woreda Water Desks was compared to the data from the BD Study, it showed that staff increased in three Desks out of six Desks. However, the actual allocation remained at a low level as the Table 6 shows that there was only four to nine

²⁹ During the BD Study (2005), spare parts that would be required for a certain period (for about three years) were provided to zones at the same time facilities were handed over. Then zones would transport the parts to woredas upon their request. However, parts were actually delivered to woredas through zones in Term 1 and provided directly to woredas in Term 2 so that parts were available at a woreda level whenever necessary (Source: Documents provided by JICA). The ex-post evaluation found that seven spare parts shops were opened as part of the previously mentioned technical assistance project, WAS-CAP. Types of shops were diverse including privately-run and publicly-run by zones and woredas (Source: Results of the second field study).

³⁰ Woreda Water Desks were supposed to support WASHCOs in organizing the operation and maintenance of facilities in this project. Thus, the ex-post evaluation did not cover Zone Water Desks and does not provide organizational information on them.

staff allocated(4.5 on average, 49% fill-rate), which did not meet the quota (9-11 people). Many of the project sites in Ethiopia were remotely located and scattered over a wide range. Some woredas involved in the project had to monitor 146 facilities (Angacha) and 272 facilities (Boloso Sore) within their jurisdictional woreda with just two or three water sector staff. Having considered this situation, the allocation of four to five at each woreda on average is hardly sufficient for Woreda Water Desk to monitor several hundred water facilities in their jurisdiction.

Table 6: Change in staff allocation at Woreda Water Desks

(comparison with the original plan)

(Unit: person)

Zone, Woreda	BD	Quota (water sector)	Actual (water sector)	Comparison with BD (change)	Notes
	2005	2012	2012		
Gedeo, Yerega Chaffe	N.A.	—	—	Non-comparable	
Hadiya, Lemo	N.A.	9	9	Non-comparable	
Hadiya, An Lemo	N.A.	9	3	Non-comparable	New woreda
Wolaita, Boloso Sore	2	—	—	Non-comparable	
Derashe, Derashe	3	9	5	Increased	
Sidama, Hula	4	—	—	Non-comparable	
South Omo, Debub Ari	N.A.	—	—	Non-comparable	
K Tembara, Angacha	5	—	—	Non-comparable	
K Tembara, Doyogen	N.A.	—	—	Non-comparable	New woreda
Dawero, Loma	2	9	4	Increased	
Silti, Dalocha	2	9	2	No change	
Silti, Siliti	2	11	4	Increased	

Source: BD Study Report (2005), Results of questionnaire survey of Woreda Water Desks.

4) WASHCO

The plan specified the roles of WASHCOs to be performing maintenance and repairing on facilities, collecting and managing the water tariff, storing and managing spare parts and tools and locking fences. The ex-post evaluation found that procuring parts was added to these roles. Staff allocation that was required for facility maintenance in the planning period involved five staff members playing the roles of chair and vice-chair of an association, secretary, accountant, water tariff collector, article manager and auditor. 52% of the 21 target WASHCOs were found

to have maintained this five-staff member structure in the study³¹. The staff allocation required for facility maintenance had been maintained at the time of the ex-post evaluation as well.

5) SWWCE

SWWCE is a public corporation established at a regional level and responsible for the maintenance of drilling machines and equipment. SWWCE has 200 staff members in their machine maintenance department including mechanics, electricians, welders and drivers and the number has quadrupled compared to the 47 at the time of planning (2005). This is explained by the increase in drivers who transport equipment and machines to the site; the staff required for machine maintenance has not increased. On the other hand, the number of machines owned by SWWCE increased by one since the BD Study and they are operating well except for one drilling machine that broke down recently. Judging from these facts, SWWCE has a sufficient staffing level to pursue their machine maintenance work.

3.5.2 Technical Aspects of Operation and Maintenance

(1) Water Resource Development Bureau

In pursuing maintenance of the facilities provided by the project, the Water Resource Development Bureau was expected to have the capacity to coordinate with lower administrative organizations as a superintendent of facility management as well as the capacity to respond to problems including large-scale defects. Among these, this study could not find any actual responses to large-scale defects. However, the Bureau continues to monitor the activities of lower administrative organizations and to support parts replacement once every three months after the project's conclusion³². Judging from these survey results, technical aspects of water facility maintenance by the Bureau are largely being maintained.

(2) Woreda Water Desk

Woreda Water Desks were expected to have the capacity to patrol villages to monitor and provide training to villages as well as the capacity for maintenance and repair techniques. Among the 12 target Woreda Water Desks in the study, eight Desks (67%) said they monitored the activities of WASHCO in the past six months and the other four Desks (33%) did not have any record of monitoring³³. While these four Desks did not patrol to monitor, they not only

³¹ An association with less than five members also fills these five roles by assigning more than one role to each officer (Source: The beneficiary survey results).

³² By principle, WASHCOs were responsible for obtaining parts at the time of the ex-post evaluation. However, many areas did not have parts retailers. Increasing parts shops is imperative in order to pursue sustainable maintenance and the Bureau is now coordinating to establish more shops. The Bureau also obtained parts that were not available at a woreda level on their behalf (Source: Results of interviews with Water Resource Development Bureau).

³³ WASHCO's response on woreda patrolling visits showed similar results to the previous "3.2 Effectiveness and

visited the sites to provide technical instruction upon request, but also repaired machines as necessary. Among the eight Desks that performed monitoring in the past six months, five of them were also targets of the technical assistance project, the Water Sector Capacity Development Project (WAS-CAP hereafter) that was implemented along with this project.

Table 7: Machine defects in each village and repairer

Zone	Woreda	Village	Number of defects	Pump	Repaired by
Hadiya	Lemo	Dulacha Belela	1	India Mark II ³⁴	Woreda Water Desk
Kambata Tembero	Doyogena	Dinika	1	India Mark II	Other
Segen Area	Derashe	Bursa	1	Other	Woreda Water Desk
Sidama	Hula	Gase	1	Afridev	Woreda Water Desk
Silte	Dalocha	Nadhuyiagam	2	Afridev	Woreda Water Desk
Walayita	Boloso Sore	warmuma	1	Afridev	Woreda Water Desk

Source: The beneficiary survey results

With regard to the repairs done by Woreda Water Desks, six out of the 21 target WASHCOs had defects in the past six months as seen in Table 6, most of which were repaired by Woreda Water Desks³⁵.

Other than this, Woreda Water Desks were expected to conduct water quality testing including sterilization of facilities and to provide various training for WASHCOs. However, they did not implement these activities as per the expectation due to the lack of budget and human resources³⁶. In addition, training for WASHCOs has not been given technical support because of a lack of budget and personnel.

Based on these facts, while Woreda Water Desks were involved in facility maintenance,

3.2.2 Qualitative Effects.” Among the 18 WASHCOs that responded to the survey, ten WASHCOs (56%) said they were visited in the past six months while eight WASHCOs (44%) said they were not visited at all (Source: The beneficiary survey results).

³⁴ India Mark II is an Indian-made hand pump for boreholes jointly designed by the government of India, WHO and UNICEF in the 1970s. (Source: Related websites). India Mark II had been used in Ethiopia in the past and was introduced based on recommendations from local industry to replace Afrideep (for wells requiring a 60m maximum operating depth) that was to be introduced but was not in stock (Source: Documents provided by JICA, results of interviews with project contractors and implementing agencies).

³⁵ India Mark II often requires the support of Woreda Water Desks’ for maintenance for technical reasons. In new woredas, Zone Water Desks or private businesses do repairing as it is hard for new woredas to provide assistance in a timely manner due to a lack of mechanics and repairing skills (Source: Results of WASHCO questionnaire survey and interviews).

³⁶ In the questionnaire survey, responses were collected from two Woreda Desks in charge of the spring water facilities provided by the project and nine Desks in charge of shallow wells. The former conducted no water quality testing or sterilization and for the latter, three Desks conducted the testing and sterilization. The three did sterilization with chlorine and the other Desks showed no record of testing (Source: The beneficiary survey results).

their capacity to implement training for WASHCOs including repair techniques, monitoring and awareness-raising activities has room for further reinforcement and improvement.

(3) WASHCO

WASHCOs were expected to have basic technical and organizational management skills in order to run water facilities. Actually, most of the 14 responding WASHCOs (with valid response) that covered the functioning facilities were engaged in routine facility checkups, replacement of chains for hand pump facilities and pipes and valves for spring water facilities as necessary, and keeping operational records after the checkup (see Table 8). Most of these WASHCOs developed action plans and implemented activities based on them (Table 8). Judging from these facts, they have basic organizational management skills.

Table 8: WASHCOs' activities

WASHCO activities	Responded WASHCO	%
Developing WASHCO action plan	12	86%
Implementing WASHCO action plan	11	79%
Using monitoring check list	7	50%
Keeping operational record	11	79%
Facility inspection	11	79%
Using financial manual	6	43%
Using field manual	5	36%

Source: The beneficiary survey results

(4) SWWCE

SWWCE was expected to be capable of maintenance including equipment and machine inspection and repair. Machines and equipment that were procured by the project and were in use are summarized in Table 9. They were all in use and functioning well except for the ones beyond SWWCE's responsibility due to lack of technical skills necessary to operate them³⁷. One cargo truck is being used by the Water Resource Development Bureau.

Based on these survey results, SWWCE meets the necessary technical standards to perform machine inspection, maintenance and repair.

³⁷ The equipment that was outside SWWCE responsibility includes those items such as electric logging equipment and microbiological testing kits. (Source: Results of interviews with Water Resource Development Bureau and SWWCE). Procured machines and equipment were planned to be handed over to SWWCE via the Bureau in the BD Study and they were actually handed over to SWWCE after they started using them. The machines and equipment that were not in use in the Table are the ones that the Bureau meant to use initially but were handed over to SWWCE with other machines instead.

Table 9: Number of machines and equipment procured by the project and current status

Machines and equipment	Number procured	Number in use
Truck mounted top drive rotary drilling rigs	2	2
Truck mounted high pressure air compressors	2	2
Cargo trucks	2	1
Cargo trucks with cranes	2	2
Dump trucks	2	2
Equipment for well drilling (Accessories and tools)	2	2
Electric logging equipment	1	Not in use yet
Handy incubators	2	Not in use yet
Microbiological testing kits	1	Not in use yet

Source: Results of interview surveys to SWWCES

3.5.3 Financial Aspects of Operation and Maintenance

(1) Water Resource Development Bureau

Their annual budget was 615 million Birr (116 million yen) in fiscal year (FY hereafter) 2011/2012 and their investment expenses were 522 million Birr during the same period (98 million yen)³⁸. There is no information on budget composition after 2009 as the Maintenance Department was broken up and reorganized into the Department of Drinking Water Supply Scheme and Maintenance after organizational restructuring. Thus, it is not able to determine if financial resources required for facility maintenance were actually available.

(2) Woreda Water Desk

Concrete annual budgets were not identified at six target Woreda Water Desks. Yet, it was found that annual budgets for concerned Desks as a whole including Energy Department and Industrial Department were increasing every year.³⁹ Breakdown of expenses includes personnel costs, onsite allowances, office expenses, maintenance costs (for vehicles and machines), raw material costs and labor costs. Expenses related to Woreda Water Desk operation including WASHCO training, technical advice and monitoring are included in the onsite allowance and maintenance costs mentioned above⁴⁰. Personnel expenses represented over 80% of the budget at four Woreda Water Desks where breakdown of expenses in FY 2011/2012 was identified; the budget for facility maintenance and monitoring was only 7% of the total. Therefore, it was not a sufficient budget to pursue responsibilities as an administrative agency that supports communities in operating and maintaining their facilities.

(3) WASHCO

All the 14 WASHCOs that have functioning facilities introduced either fixed-rate or

³⁸ Calculated based on the exchange rate (1Birr=5.29 yen) at the time of the ex-post evaluation (July 2013).

³⁹ Source: The beneficiary survey results

⁴⁰ Source: Results of interviews with Woreda Water Desk at the time of the ex-post evaluation

metered systems to collect a water tariff regularly from residents⁴¹. As for the rate, 11 WASHCOs (85%) attained the 1-3 Birr/month level that was established by the BD Study and this included metered amounts as well⁴². To the question on water tariff collection rate, eight out of 14 WASHCOs excluding one that did not respond (62%) answered “the collection rate was over 80%” and this showed that the water tariff was continuously collected. Money collected from residents was then pooled as a reserve that is to be used to cover labor costs, spare parts and transportation required for repairing. While the cost of repairing itself was supposed to be covered by the reserve in principle, money is additionally collected from residents when the reserve is not enough. Interviews with WASHCOs found that additional collections took more time at the time of repairing.

Regarding the water tariff, over 80% of the facility using households (67/80) answered that it was “a reasonable price” or “cheap.” This shows that the level is appropriate for the living standard of the residents. Additionally, most of the households (72/80) were affirmative in paying extra for necessary improvement of facility functions. 80% of 14 WASHCOs that were managing functioning facilities provided their financial reports to Woreda Water Desk and residents, while only five out of 14 WASHCOs (36%) kept books and only half of the WASHCOs were saving money in their WASHCO bank accounts⁴³.

Judging from these facts, while some of the WASHCOs that manage functioning facilities have problems in financial management, they have the financial capability to perform basic facility maintenance.

(4) SWWCE

Just as planned, SWWCE recorded profit and its management is in surplus (Table 10). The profit covers all the costs for operation and maintenance of machines and equipment, staff salaries and purchasing of spare parts. Therefore, they had sufficient financial resources and no problem was identified in operating and maintaining machines and equipment. The major increase in balance and profit between FY 2009/2010 and FY 2010/2011 is explained by the fact that the number of constructed wells largely increased between FY 2007/2008 and FY 2008/2009 (Table 11).

⁴¹ Breakdown includes seven out of 14 WASHCOs required water facility users for money contribution as a water tariff and 7/14 WASHCOs as management costs (Source: The beneficiary survey results).

⁴² Excluding one WASHCO that did not respond.

⁴³ About half of them (6/14 WASHCOs) kept their savings in their accountants' residence (Source: The beneficiary survey results).

Table 10: Balance and profit of SWWCE

Item/year	FY 2008/2009	FY 2009/2010
Balance	37 million Birr	165 million Birr
Profit	0.1 million Birr	1.5 million Birr

Source: Documents provided by the SWWCE

Table 11: Number of SNNPRS owned drilling machines and constructed wells

Item/year	FY 2006/07	FY 2007/08	FY 2008/09	FY 2009/10	FY 2010/11	FY 2011/12
Number of functioning drilling machines (No. of machine)	6	3	7	7	6	6
Total number of constructed wells (No. of sites)	71	8	60	56	21	34
Number of constructed wells per machine	11.8	2.67	8.57	8	3.5	5.67

Source: Source: Documents provided by the SWWCE , Result of interviews survey with SWWCE

3.5.4 Current Status of Operation and Maintenance

(1) Current status of water facility operation and maintenance

The nonfunctioning rate of water facilities provided by the project was 34% (76/225), which was about the same level as the national average at 35% (2010). This rate is higher than the 25% average of SNNPRS⁴⁴. At the 25 hand pump shallow wells that were inspected onsite during this study, a nonfunctioning rate of facilities that used Afridev hand pumps was 25% (4/16) and 56% (5/9) for India Mark II⁴⁵. Major repairs included replacement of pipe, pipe assembly parts, PVC water pipe, chains, and seals. The high nonfunctioning rate is explained by the following reasons.

- Administrative jurisdictions have been changed and new woredas were established as a result. However, they are not able to repair water facilities in their jurisdictional areas due to lack of staff, repairing tools and technical skills;
- India Mark II requires special tools for repairing including chain blocks and thus woredas have to be involved in repairing. However, some of the new woredas do not have such tools and could not repair them. Woredas without repairing skills have to request repairing assistance from zones and regions, which in turn required longer time for repairing⁴⁶;
- As a result of a technical assistance project, WAS-CAP, seven spare parts shops opened in SNNPRS and made spare parts procurement easier at woreda and zone levels. However, these shops did not carry enough parts for India Mark II compared to those for Afridev and

⁴⁴ Sources of nonfunctioning rates for Ethiopia and SNNPRS are Universal Access Plan 2011 Revised Edition (Ministry of Water and Energy). Nonfunctioning numbers of facilities by their type are 67/201 for hand pumped shallow wells and 9/24 for spring water facilities (Source: The beneficiary survey results).

⁴⁵ Hand pump for shallow wells made in India (maximum operating depth: 40m). This pump has been introduced not only in Ethiopia but also in its surrounding African countries (Source: BD Study Report (2005)).

⁴⁶ Afridev hand pumps are repairable at a community level (Source: Documents provided by JICA).

Afrideep, and delivery usually took longer. There is not a sufficient selection of parts at new shops either;

- Among the 21 Woreda Water Desks that were interviewed, only half of them were monitoring facilities due to a lack of monitoring staff, lack of modes of transportation and activity budget, and problems with site locations. This situation makes it harder to identify defects at an early stage; and
- Collecting a repair fee at a community level takes a long time.

Five of the 18 target woredas were also included in the target woredas of WAS-CAP, the technical assistance project, that was implemented in SNNPRS for four years from 2007 to 2011. The nonfunctioning rate was 28% in five woredas, which was 6% lower than the 34% nonfunctioning rate of 225 facilities in total. Developing a parts procurement network and technical training for WASHCOs by technical assistance project implemented during this grant aid project reinforced the system for facility maintenance and contributed to the stable high functioning rate.

(2) Current status of machines and equipment operation and maintenance

The machines and equipment provided by the project were first delivered to Water Resource Development Bureau and then managed by SWWCE. However, electric logging equipment, testing kits and handy incubators had not been used at the time of the ex-post evaluation. Interviews with involved agencies found that they were not used due to a lack of experts who could properly handle them as well as the fact that procured equipment was not stored at the Water Resource Development Bureau that was responsible for developing water facilities implementation plans and selecting sites, but instead, stored at SWWCE that manage drilling machines⁴⁷.

Other machines and equipment have been in regular use after procurement and maintenance and inspection have been properly done.

In summary, some problems have been observed in terms of staff allocation, technical and financial levels at Woreda Water Desks, and the financial situation of WASHCO, therefore sustainability of the project effect is fair.

⁴⁷ Prior to constructions of water facilities, the Water Quality Testing Team of the Water Resource Development Bureau performs the testing using the Microbiological testing kit and handy incubators (Source: Results of interviews with SWWCE).

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aims to provide the residents of 106 villages in 14 woredas of 10 zones in SNNPRS with access to safe drinking water. The project constructed water facilities and set up WASHCOs in order to continuously run and maintain those water facilities⁴⁸. The objective of this project is highly relevant to the country's development policy, development needs, as well as the ODA policy that Japan upholds. The percentage of people provided with water access by the project remains at 61% of the target value because the functioning rate of water facilities was 66%. However, the intended effects in the project are observed such as that water facility users noted that water related diseases had decreased and opportunities to effectively utilize time for daily activities had increased by reduced water-fetching workload. Thus the effectiveness and impact of the project are fair. The project cost was lower than planned; yet the project period exceeded the plan due to ethnic conflicts, and roadblocks caused by landslides and the washout of roads used for transporting equipment. Thus the efficiency of the project was fair. With regards to the operation and maintenance of facilities, 66% of the constructed facilities by the project are now functioning while the staffing, maintenance skills and financial capacity of Woreda Water Desks, which play central roles in maintenance, have room for improvement. Thus the sustainability of the project effect was judged to be fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Improving facility functioning rates

Among the water facilities developed in this project, Afridev pumps are easily repairable and WASHCOs can handle them while India Mark II requires a chain block and other special tools for repairing. As a result, Woreda Water Desks without proper tools often cannot perform repairs. Some of the newly born woredas do not have sufficient technical skills and systems to pursue a maintenance operation and do not perform repairs due to lack of techniques and resources. In addition, while spare parts shops are opening in local woredas and neighboring zones, spare parts for India Mark II pumps are rarely in stock compared to others, and recently-opened shops have a limited selection of parts. Such inventory shortages are one of the factors that prolong downtime.

With the above in mind, the following measures should be taken for enhancing the functioning rate of water facilities in the future. Water Resource Development Bureau and other agencies are recommended to ① ensure that Woreda Water Desks are equipped with necessary

⁴⁸ At the time of ex-post evaluation, target woredas increased to 25 along with the jurisdiction change.

tools for repairing India Mark II, ② provide training on repair techniques for Woreda Water Desks that are in charge of repair and maintenance of facilities, and ③ further promote for developing a network for parts arrangement to allow regular and systematic parts procurement, in order to encourage more prompt and appropriate repairs.

(2) Reinforcing organizational strength at Woreda Water Desk

In addition to the repairing techniques mentioned above, Woreda Water Desks are expected to perform various activities as one of the major actors for water facility maintenance including monitoring by patrolling villages to spot problems early on and prevent defects in advance, continuous hygiene education and facility sterilization. However, only a few woredas are actually engaged in these activities. Interviews conducted during the study identified a lack of human resources, modes of transportation, and program funding as the factors that prevent Woreda Water Desks from active involvement. Reinforcing organizational strength of Woreda Water Desks is essential to enhance the functionality of facilities and maintain the population with water access that was intended in this project. With the above in mind, concrete measures for the future will be ① recruiting staff, ② making roles of Woreda Water Desks widely known and ③ reinforcing budgetary measures. Above all, securing budgets for repair and maintenance of facilities should be noted in the future as the current focus is mainly on constructing new facilities.

(3) Reinforcing the financial capability of WASHCO

Among the interviewed WASHCOs, a water tariff was collected from residents in all villages regardless of the functionality of facilities and if their saving could not cover repair costs, they collected supplementary fees from residents. However, interviews found that collecting a supplementary fee from residents after they made regular payments based on a fixed-rate or metered system was difficult and time consuming. Most of the WASHCOs have cashiers but bookkeeping was hardly done after collecting the water tariff. Usage and balance of their reserve are not clearly known.

Thus, in order to respond to facility defects immediately and reduce downtime, WASHCOs' financial capability needs to be reinforced so that they can strictly manage the money after routine collection from residents and retain the necessary level of savings for future facility repair and maintenance. If the current rate of the water tariff is not enough to cover repairs, a reorganization of the rate structure should also be considered.

4.2.2 Recommendations to JICA

No recommendation.

4.3 Lessons Learned

(1) Ensuring availability of required tools and spare parts

The project originally planned to distribute basic tools and spare parts required for facility maintenance from a construction company to Woreda Water Desks via Zone Water Desks in Term 1. However, this was not ensured as some woredas did not receive tools even a year after the facility handover and thus their facility maintenance was negatively affected. To address this problem, some measures were taken in Term 2 including distributing tools to Woreda Water Desks directly.

Tools and spare parts are essential to perform routine maintenance of facilities. Thus, if the procurement and distribution of such tools and basic spare parts are required for any similar future projects, immediate procurement and distribution need to be ensured so that the repairing agency⁴⁹ have them ready for facility maintenance.

(2) Effective use of procured machines and equipment

The study found that most of the drilling machines provided by the project have been used and properly maintained by SWWCE, which was the intended user of those machines in the original plan. However, among the machines and equipment provided by the project, electric logging equipment and microbiological testing kits were supposed to be stored at the receiver and yet they were given to SWWCE with other drilling machines after the second inspection for defects. They were after all left unused due to a lack of experts in SWWCE and a disparity in their responsibilities.

Therefore, it is necessary to ensure proper storage and maintenance of those machines and equipment at the agencies that are intended or expected to use them in order to effectively utilize procured machines and equipment.

⁴⁹ In this project, Woreda Water Desks are the repairing agency.