

United Republic of Tanzania

FY2019 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Improvement of Rural Water Supply in Tabora Region”

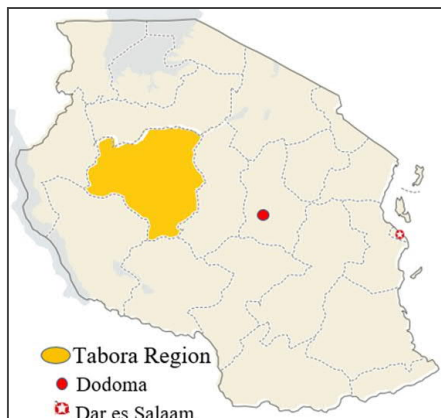
External Evaluator: Hisae Takahashi, Ernst & Young ShinNihon LLC

0. Summary

This Project was implemented to increase the population served of the water supply and the water supply coverage in the Tabora region of Tanzania by constructing water supply facilities and procuring equipment, thus helping improve the living environment of the target areas. Its purpose is in line with the development policy and sector plan of Tanzania, which emphasizes efforts to improve access to safe water in rural areas and the need to develop water supply facilities, in addition to Japanese aid policy. Accordingly, the relevance of the Project is high. Both the project cost and period were within the plan, thus the efficiency of the Project is also high. The water supply facilities constructed in this Project have significantly increased the population served of water supply and water supply coverage in the target areas, as well as reducing the cost to purchase water. The incidence of waterborne diseases has also declined due to the use of clean water. Reducing the time of fetching water has boosted the amount of agricultural activity women can do and helped improve their lives. In addition, despite some issues, the Community-Owned Water Supply Organizations (COWSOs) established through this Project are involved in community-based Operation and Maintenance (O&M) of water supply facilities and so on, so the effectiveness and impact of this Project are high. In terms of sustainability, however, some minor problems have been confirmed in institutional/organizational and financial aspects as well as maintenance status. The problems include a shortage of personnel to monitor water supply facilities and COWSOs, and the decreased involvement of COWSOs in O&M and water charge collection work. Accordingly, the sustainability of the Project effects is fair.

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

1. Project Description



Project Location



Piped Water Supply Scheme (Uyui District)

1.1 Background

At the time of planning, the water supply coverage in rural Tanzania stagnated at 58.7% (2009) as a national average, with a figure of 49.1% (2009) for the Tabora region which lies in the central parts of Tanzania, the fourth-lowest in the country. Given the low annual rainfall in the region and the fact that the ground is mostly comprised of base rock, drilling boreholes in this area was regarded as very difficult from a technical perspective. Accordingly, there was a great lack of support to construct water supply facilities domestically and from abroad compared to elsewhere in Tanzania. In addition, the function of existing water supply facilities had deteriorated due to aging, forcing the villagers to use traditional water sources and the use of contaminated water was one of the reasons explaining why waterborne diseases among villagers comprised 32.6% of all diseases in the Tabora region.

Following this situation, the government of Tanzania requested support to evaluate the groundwater potentials and examine the feasibility of priority projects to develop water supply facilities in the Tabora region. In response, the government of Japan implemented a technical cooperation development project, including the basic design survey for the grant aid project. This Project was implemented with a focus on activities identified as priority based on the survey result, in order to improve water supply coverage in the Tabora region.

1.2 Project Outline

The objective of this Project is to increase the water supply population and improve the water supply coverage in Tabora region by constructing water supply facilities and procuring equipment for groundwater development, thereby contributing to the improvement of the living environment in the target areas.

Grant Limit/Actual Grant Amount	7.6 million yen/7.6 million yen (Detailed design) 1,792 million yen/1,790 million yen (Civil works)
Exchange of Notes Date /Grant Agreement Date	March 2013/March 2013 (Detailed design) November 2013/November 2013 (Civil works)
Executing Agencies	Ministry of Water, Rural Water Supply and Sanitation Agency (Department of Rural Water Supply, Ministry of Water till 2019)
Project Completion	September 2016
Target Area	One city (Tabora municipality), 20 villages of five districts (Igunga, Nzega, Sikonge, Uyui, Urambo)
Main Contractor	Konoike Construction Co., Ltd.
Main Consultant	Earth System Science Co., Ltd.

Basic Design Survey	August 2009 – May 2011 ¹
Related Projects	[Technical Cooperation] • The study on rural water supply in Tabora region in the united republic of Tanzania (2009 – 2011) • Rural Water Supply and Sanitation Capacity Development Phase 2 (2011 – 2014) [Other international organizations and aid agencies] • Basket fund supported by the African Development Bank and World Bank, <i>Water Sector Development Plan</i> (2007 – 2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Ernst & Young ShinNihon LLC

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: July 2019 – October 2020

Duration of the Field Study: October 17 – November 12, 2019

2.3 Constraints during the Evaluation Study

The second field survey of this evaluation survey was cancelled due to the COVID-19 pandemic. Thus, additional information, feedback on the evaluation summary with the executing agency and receiving of comments, all of which were scheduled for the second field survey, were conducted remotely with the support of local associates.

3. Results of the Evaluation (Overall Rating: A²)

3.1 Relevance (Rating: ③³)

3.1.1 Consistency with the Development Plan of Tanzania

At the time of planning, *the Tanzania Development Vision 2025* (1999), the Tanzanian development policy, stated to aim at improving the quality of people's lives, achieving good governance based on law and realizing a competitive and strong economy. In the water sector, *the National Strategy for Growth and Poverty Reduction II* (2010/11 – 2014/15), formulated based on the above vision, clearly stated the target of improving the rural water supply coverage

¹ “The Study on Rural Water Supply in the Tabora Region” which was implemented from August 2009 to May 2011, was a technical cooperation development project including a basic design survey for grant aid project. The activities of the first year of this survey involved formulating “The Project for Improvement of Rural Water Supply in the Tabora Region” (This Project) and a request for the grant aid to implement this Project was submitted.

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

³ ③: High, ②: Fair, ①: Low

from 53 to 65%. *The Water Sector Development Plan (WSDP) (2006 – 2025)*, a long-term sector plan formulated by the Ministry of Water at that time, also aimed to increase water supply coverage in the rural areas to 74% by 2015 and 90% by 2025 based on a sector-wide approach financed by the basket fund⁴.

*The second Five-year Development Plan (2016/17 – 2020/21)*⁵, the development policy as of the ex-post evaluation, includes “promoting human development and social reform” to meet the goals of *the Tanzania Development Vision 2025*. It indicates that access to safe water in rural areas would be improved to 85% by 2020/21, thus confirming that an improved water supply in rural areas remains a priority. *The WSDP II (2014/15 – 2018/19)*⁶, which is a successor to *WSDP*, also aims to improve access to safe drinking water by enhancing water supply capacities in rural areas, strengthening water usage organizations and taking an integral approach on water supply and sanitation issues. In particular, it described to improve the water supply coverage for safe drinking water in rural areas from 51% to 80%. In 2019, *the Water Supply and Sanitation Act, 2019* was formulated and the Rural Water Supply and Sanitation Agency (RUWASA), which oversees local water supply operations, was established under the abovementioned Act. Accordingly, the O&M of water supply in rural areas was handed over from the Ministry of Water to a system run under the RUWASA⁷.

As mentioned above, the development policy of Tanzania and the water sector plan have clearly aimed to improve water supply coverage in rural areas with specific target values from the time of planning to the time of the ex-post evaluation. It is thus consistent with the purpose of this Project which developed water supply facilities in the Tabora region with low water supply coverage in rural areas.

3.1.2 Consistency with the Development Needs of Tanzania

The water supply coverage in rural areas of Tanzania at the time of planning stagnated at a national average of 58.7% (2009) and the figure for the Tabora region was 49.1%, one of the lowest in terms of water supply. The average annual precipitation in the Tabora region was only 960 mm (2002), below the national average of 1,100 mm, so most of the water supplied was groundwater due to the limited surface water. Moreover, since the ground is mostly comprised of base rock in this area, it is difficult to identify the aquifer to develop groundwater and drill boreholes from a technical



Women collecting water from traditional water source

⁴ Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*

⁵ Source: *National Five-Year Development Plan 2016/17 – 2020/21*

⁶ Source: *Water and Sanitation Development Plan 2014/15 – 2018/19*

⁷ Based on the interviews to the Ministry of Water and RUWASA Tabora regional office

perspective. Moreover, existing water supply facilities had degraded 20 to 30 years after construction and their functions had declined. Accordingly, the water supply coverage, reflecting the utilization rate of water supply facilities, was even lower than the abovementioned coverage and forced villagers to use contaminated traditional water sources⁸, raising concerns over health conditions⁹.

At the time of the ex-post evaluation, water supply coverage was 68% (2018) in rural areas of the country and 52% in the Tabora region, figures which improved from the planning stage thanks to support from this Project. However, the low water supply coverage in rural areas remains unresolved. Moreover, unchanged topographical conditions mean people still rely on groundwater as a water source. However, since the operating rate of more than 1,500 water supply facilities in the Tabora region is about 50%¹⁰, the need to develop water supply facilities to improve coverage in the region remains high.

3.1.3 Consistency with Japan's ODA Policy

The Country Assistance Policy for Tanzania (2012) identified infrastructure development supporting economic growth and poverty reduction as one of the priority areas. The Project, which developed water supply facilities in rural areas, corresponds to infrastructure improvement and also helped Yokohama Action Plan of the fifth Tokyo International Conference on African Development (TICAD IV) as well as contributing toward “improved access to safe drinking water” as one of the Millennium Development Goals, meaning that the Project was consistent with Japan's ODA policy.

In light of the above, the Project has been highly relevant to the Tanzania's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

(1) Japanese side

The main output of the Project comprised piped water supply schemes with public water points (Level 2) and deep wells with hand pumps (Level 1), procurement of geographical survey equipment to develop groundwater, capacity building support (soft component) for O&M of water supply facilities and hygiene plans and for improving the technical groundwater development survey capacity as well as consulting services. Tables 1 through 3 show the plan

⁸ A traditional water source which was used from the past. The water is white and turbid and manure from domestic livestock flows alongside the rain water, making it extremely unclean. The photo is from the report of *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*.

⁹ Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*

¹⁰ Based on the questionnaire answer from the RUWASA Tabora regional office

and actual output of the Project.

Table 1 Planned and Actual Output (Construction of Water Supply Facilities)

(Unit: Number of Facility)

District/Municipality	Plan		Actual	
	Level 2	Level 1	Level 2	Level 1
Igunga district	0	12	0	11
Nzega district	1	23	1	65
Sikonge district	0	20	0	12
Uyui district	2	12	2	9
Tabora municipality	1	15	1	7
Urambo/Kaliua district	0	32	0	7
Total	4	114	4	111

Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*, document provided by JICA, questionnaire answer from the RUWASA Tabora regional office.

Note: The Urambo district was subdivided into the Urambo and Kaliua districts during the implementation of this Project.



Level 2 water supply facility
(Tabora municipality)



Level 1 water supply facility
(Sikonge district)

The Level 2 water supply facilities were installed as planned, and Level 1 water supply facilities were also installed almost as planned (97%) (see Table 1). The specifications and quantities of the piping/the ancillary of Level 2 water supply facilities¹¹, the villages where Level 1 water supply facilities were installed, drilling borehole locations, criteria for judging success/failure, installed locations and extension of piping, piping installation method, public water point positions and distribution route of water were changed. Since these are all minor changes, it was confirmed that there was no impact on the generation of the effects, the project cost and period due to the changes, which would affect the judgement of five evaluation criteria. Details of each change and the reasons behind them are as follows:

¹¹ The number of switches for the hydraulic valve box/piping diameter of the drain tanks were changed, the number of procured tool boxes for the O&M of the machine room and portable GPS were added and so on.

[Major changes of output (water supply facility) and reasons]

① Change of the target village for the Level 1 water supply facilities:

Uyui → Kalmuwa village in Tabora municipality

[Reason] Since Uyui village was confirmed as the target village of another project for developing water supply facilities planned by the Tanzanian side, the village was replaced by Kalmuwa village of the same Tabora municipality as an alternative village to avoid duplication. Kalmuwa was newly selected as the target village for the Project as it was rated as the highest priority among those villages excluded during the planning stage of this Project¹².

② Additional maintenance tools for the mechanical room

[Reason] The maintenance system was reviewed and it was considered necessary to supply maintenance tools for each district where the Level 2 water supply facility was installed.

③ Revised criteria for success/failure of boreholes for the Level 1 water supply facility¹³

<Changes of the water quality requirement>

● Manganese

Revised from 0.4 mg/litre, the water quality standard in line with World Health Organization (WHO) guidelines to 0.5mg/litre, the Tanzanian drinking water standard.

[Reason] The Tanzanian standard was applied, since this part was removed in the revision of the WHO guidelines on the grounds that it has no impact on human health.

● Nitrate

Revised from 50 mg/litre, the water quality standard in line with WHO guidelines, to 75 mg/litre, the Tanzanian drinking water standard.

[Reason] At the time of planning, the water quality standard, which was one of the factors for determining the success or failure of drilling boreholes, was mainly in line with WHO guidelines. Meanwhile, although some boreholes exceeded the values of the WHO guidelines, they remained within the Tanzanian water quality standard. The success rate of borehole drilling was also lower than planned and to supply clean and safe water to more people, the water quality requirement was revised, reflecting the opinion of the Ministry of Water and a consultant that this change would be less likely to affect the health of residents¹⁴. In case nitrates exceeded 50 mg/litre, this change was applied after confirming via guidance to villagers that this water could be considered drinkable but should not be given to infants¹⁵.

¹² Based on the questionnaire answer from the RUWASA Tabora regional office and the interviews to the consultant

¹³ At the time of planning, the success rate of drilling boreholes was estimated at 50.4%, however, the result was as low as 33.3% when 114 boreholes, the planned number, had been drilled. Subsequently, the success rate increased to 42.5% due to the changes in requirements and target villages.

¹⁴ Documents provided by JICA and interview surveys with the Ministry of Water and the consultant. In addition, the WHO guidelines remain guidelines alone and each country is individually responsible for determining water quality standards.

¹⁵ Nitrate ions bind to hemoglobin in the blood of bottle-fed infants (babies and infants raised on powdered milk) and

According to interviews with the RUWASA Tabora regional office and villagers during the site surveys, no harm to health had not been reported.

<Changes of yield (water volume)>

- Required yield: Revised from 6.7 to 3.0 litre/min

[Reason] Increased success rate due to easing the criterion allows the planned number of water supply facilities to be secured as well as ensuring further access to safe water in areas where the efforts to drill boreholes were unsuccessful and the required water yield could not be secured. It was assumed that this change would reduce the number of villagers accessing the water from 250 to 112 persons per borehole per day. Conversely, it has become easier for villagers who were otherwise forced to use contaminated traditional water sources to access safer water where it was not previously possible to secure sufficient water. Accordingly, as an exceptional measure, this change was allowed for only one borehole per village and a maximum of ten boreholes in this Project. It was confirmed that no cases of insufficient water in the villages covered were reported including the dry season in each RUWASA district office and the target villages by the time of the ex-post evaluation.

④ Relocated drilling boreholes

[Reason] The drilling boreholes, mainly at the Urambo and other districts, where success rates were low, were relocated to the villages of Nzega, Igunga and other districts, where obtaining more water was much likelier. According to the RUWASA Tabora regional office, despite the planned number for each district being revised, in this region, where it is difficult to identify aquifers and drill boreholes, the Ministry of Water prioritized efforts to ensure an increased water yield throughout the entire region, even if the points of drilling boreholes by districts were changed. Accordingly, boosting the success of boreholes drilled by relocating them to areas with higher drilling success rates was considered an appropriate decision.

Table 2 Planned and Actual Output (Procurement of Equipment)

Item	Plan	Actual
1. Electro magnetic survey equipment	1 set	As planned
2. Two-dimensional resistivity survey equipment	1 set	As planned
3. Global positioning system (GPS)	4 sets	5 sets

Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania* and documents provided by JICA

Electro magnetic survey equipment and two-dimensional resistivity survey equipment for groundwater development were procured as planned (See Table 2). The number of procured

may cause methemoglobin crystals, but do not otherwise harm human health.

Global Positioning Systems (GPS) was increased to add the number of GPS receivers required in line with the division of the target Urambo district. Since GPSs have been utilized effectively at each district office to capture location information for boreholes and water supply facilities, the appropriateness and need to procure GPSs for all the target districts can be considered high.

Table 3 Planned and Actual Output (Consulting Service, Soft Component/Training Sessions)

	Plan	Actual
Consulting service	Detailed design, Supervising civil works and procurement	As planned
Technical assistance: Capacity building for O&M	1) Establishing a community-based O&M mechanism 2) Enhancing the scope for Local Government Authorities (LGAs) to support local communities 3) Measuring the impact generated by the project 4) Organizing a system of health education concerning water and sanitation	- As planned (summarized as follows): 33 counterparts from target districts/municipalities and 7,505 villagers participated in the activities. 1) An explanation as to how COWSO was established, selected and approved the representative, the water rates set, members registered, an O&M plan prepared and support to implement technical and management training sessions on O&M, etc. 2) Trainings on COWSO management, responses to technical issues/troubles and so on for LGAs and OJT implementation 3) Participatory monitoring and evaluation and preparation of checklist 4) Explanation to the village representatives concerning the type and prevention of waterborne diseases, harm to health caused by fluorine in groundwater and maintenance of hygienic public water taps
Capacity building for groundwater development, including geographical survey methods	1) Formulating the well sitting survey in the target area 2) Boosting geophysical survey skills 3) Analysing the survey data and formulating the groundwater development plan	- As planned (summary explained as follows): - Four staff members participated from the Tabora Branch of the Lake Tanganyika Basin Office. 1) Study using existing well data and analytical training using GIS topographic data 2) On-site training to operate equipment, conduct effective line surveys, troubleshooting, etc. 3) Data analysis by comparing various aspects, reviewing the existing groundwater development plan for formulating a new plan

Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*, documents provided by JICA, questionnaire answer and the interview survey to RUWASA Tabora regional office

In this Project, formulating the COWSO mechanism for O&M of water supply facilities, support for LGAs monitoring COWSOs and training to use the equipment continuously were conducted as planned (See Table 3). The soft components were designed to ensure sustainability of the project effects generated and the expected effects are described in “3.4 Sustainability”.

(2) Obligations of Tanzanian side

The following five items were planned to be covered by the Tanzanian side.

- 1) Arranging a water use permit for water sources
- 2) Arranging permission, attending and inspection for the pipe-laying work traversing the railway and bearing the necessary cost
- 3) Arranging the necessary procedures to lay the pipeline under or alongside the main roads
- 4) Announcing to the villagers at target areas before starting to construct the water supply facility
- 5) Covering the cost of daily allowance and travel expenses for participants from the Tanzania side to technical support for geographical surveys and implementing soft components

It was confirmed that the abovementioned planned items were implemented as planned through the questionnaire answers from the Ministry of water and the RUWASA, and interview survey to the executing agency and the consultant.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The Japanese side covered a cost of 1,797 million yen against the Exchange of Notes (E/N) limit of 1,799 million yen, which was within the plan (99.9% of the plan). The planned project cost, including the burden of approximately 14 million yen on the Tanzanian side, was 1,804 million yen, but the total project cost could not be compared because the records of the expenditure on the Tanzanian side could not be ascertained. However, since Tanzania's burden was largely implemented as planned (see “3.2.1 Project Outputs”), it is considered that expenditures were made as planned.

3.2.2.2 Project Period

The project period¹⁶ was planned to be 37 months, but actually it was 35 months from November 2013 to September 2016, which was within the plan (95% of the plan). The Project was completed within the planning period, while modifications such as relocating the drilling boreholes were made. The consultant explained that it can be attributed to the fact that all related parties, including the consultant, contractor, each regional/district office and the Ministry of Water, tried to communicate closely with each other and if any concerns arose, the information was shared, and solutions were discussed at an early stage. Zero accidents having occurred in the field was also considered as one of the contributing factors.

In the light of above, both the project cost and project period were within the plan. Therefore, efficiency of the Project is high.

¹⁶ The project period is defined from the month of the start of DD to the end of completion of the construction.

3.3 Effectiveness and Impacts¹⁷ (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

(1) Population served with water and water supply coverage

The population served with water in 2019, at the time of the ex-post evaluation, was 45,464, which achieved the target (45,000) set during the planning for 2020, four years after project completion. Although the water supply coverage was below the target, since it exceeded 80% ($44.4/53.5 = 83.0\%$) of the target (53.6%), the target is deemed as having been almost achieved.

Table 4 Population Served with Water and Coverage at Target Districts/Municipalities

	Baseline	Target	Actual		Achievement
	2009	2020	2016	2019	
		4 Years After Completion	Completion Year	3 Year After Completion	
Population served with water (person)	4,250	45,000	30,350	45,464	101%
Water supply coverage ^{Note 1} (%)	7.8	53.6	42.3	44.4	83.0%

Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*, documents provided by the RUWASA Tabora regional office and each district office

Note 1: Population served with water / population

(2) Safe and clean water volume and time for fetching water

Before implementing the Project, a certain volume of water was obtainable from traditional water sources during the rainy season. However, the quality was problematic and it was difficult to obtain safe and clean water (see the following section for the change of water quality). In addition, water sources dried up during the dry season and households who could obtain water sources within 30 minutes were only about 25% of the local population. After implementing the project, sufficient safe and clean water became available within target areas during both rainy and dry seasons by establishing water supply facilities.

¹⁷ Sub-rating for Effectiveness is to be put with consideration of Impacts.

Table 5 Available Safe and Clean Water Volume per Day and Time when Fetching Water at the Target Districts/Municipalities

	Baseline	Target	Actual		Achievement
	2009	2020	2016	2019	
		4 Years After Completion	Completion Year	3 Year After Completion	
Daily available water volume	20 – 25 (little/person/day) Unsafe water	20 – 25 (little/person/day) Safe and clean water	20 – 25 (little/person/day) Safe and clean water		Achieved
Time for fetching water	Ratio of household who can fetch water within 30 minutes: Rainy season : 56.7% Dry season : 25.3%	Access to safe and clean water resource: Within about 400m and 30 minutes	Most of villagers have access to safe water resource within 400 m and 30 minutes		Achieved

Source: *The Study on Rural Water Supply in Tabora Region in the United Republic of Tanzania*, questionnaire answer from the RUWASA Tabora regional office

(3) Number of Community-Owned Water Supply Organizations (COWSOs)

In this Project, four Level 2 water supply facilities and 111 Level 1 water supply facilities (115 water supply facilities in total) were established in 33 villages in six districts and one municipality in the Tabora region. COWSO was planned to be formed in each village where water supply facilities were installed and actually established in all 33 villages where the water supply facilities were installed as planned. As described in “3.2.1 Output”, the villagers learned the COWSO role and also obtained insights and experiences through training sessions for implementing the O&M of the installed water supply facilities. Accordingly, the COWSO-based O&M of the Level 2/1 water supply facilities has been carried out in principle.

Table 6 Number of Community-Owned Water Supply Organizations (COWSOs)

Baseline	Target	Actual		Achievement
	2020	2016	2019	
	4 Years After Completion	Completion Year	3 Year After Completion	
0 ^{Note 1}	COWSOs are formed for 118 water supply facilities and carry out O&M	33 COWSOs have been formed for 115 water supply facilities and carry out O&M		Achieved

Source: *The Study on Rural Water Supply in Tabora region in the United Republic of Tanzania*, questionnaire answer from the RUWASA Tabora regional office

Note 1: As COWSOs were formed in conducting this Project, the baseline was regarded as 0.

3.3.1.2 Qualitative Effects (Other Effects)

(1) Improvement of drinking water quality

Before implementing this Project, most of the villagers relied on water points called traditional water sources and shallow wells for their livelihoods. Since livestock also used the

same sources, the water was too unhygienic for drinking. Their water source was shifted to deep wells, which paved the way to obtain safe and clean water by installing them as part of this Project. In the Tabora region, COWSO was to report to each district office of RUWASA, in case concerns over the colour or odour of water or impacts on physical condition emerged. However, no complaints about water quality were reported after project completion. In addition, the water quality was reportedly improved in all the villages visited in the course of interviews conducted during site surveys¹⁸. In some wells, it was explained that the water tasted very salty but would not harm health¹⁹.



(Photo: Left)

Traditional water source



(Photo: Right)

Water from the water supply facility installed under this Project

(2) Cost reduction of obtaining water

Before implementing this Project, the villagers used to purchase water from water vendors during the dry season. The rate of water varied from year to year and based on the distance to deliver the water, but the average amount at the time was 100 to 300 Tanzanian Shillings²⁰ (Tsh)/20 litres, according to villagers. After the Project, the water from the Level 2 supply facility was priced at 50 Tsh/20 litres, reducing the cost of purchasing safe drinking water to between half and 1/6 of the original cost. In addition, at the Level 1 water supply facility, a water charge of approximately 500 to 2,000 Tsh per month is levied on each household²¹. If they purchase water from water vendors, it costs about 3,750 to 11,250 Tsh²² per person per month. Accordingly, it can be said that this Project has greatly helped reduce the costs of obtaining water for users of a Level 1 water supply facility as well.

The monthly cost per person of obtaining water was reduced by approximately 1,875 to 9,375

¹⁸ During the site visit, the evaluator visited 21 COWSOs out of the total 33 COWSOs formed in this Project. The key informant interviews with three COWSO members (representatives, secretaries and accountants) at seven sites and each representative at 12 sites were conducted. As for two sites, since the schedule of COWSO member could not be arranged, only work to confirm the facilities could be carried out. In addition, 30 of the total 115 water supply facilities were inspected, about three to five water users at each facility were interviewed on effectiveness, impact and sustainability.

¹⁹ One facility confirmed that the well water was excessively salty, thus the well is used for livestock at the time of the ex-post evaluation.

²⁰ The exchange rate at the time of the ex-post evaluation (as of October 2019) was 1 Tsh = 0.05 yen.

²¹ As described in "3.4 Sustainability", the water price is set by each COWSO and the price also differs.

²² Estimation based on the volume of water required per person is 25 litres per day, as defined by the Ministry of Water.

Tsh²³ for users at the Level 2 water supply facility and by approximately 3,500 to 11,000 Tsh²⁴ at the Level 1 water supply facility, which corresponds to 0.4 to 2.5% of the average monthly income of Tanzania²⁵. In the Tabora region, with the sixth-highest level of poverty among all 26 regions in the country²⁶, income levels are considered even lower. Accordingly, the contribution to reduce the cost of obtaining water by establishing water supply facilities under this Project is considered even higher in the Tabora region²⁷.

3.3.2 Impacts

3.3.2.1 Intended Impacts

(1) Decrease in incidence of waterborne diseases

In the target areas, drinking safe water has become possible due to changes in villagers' water sources. Despite the lack of data to show incidences of waterborne diseases in the target areas, the result of interviews with each RUWASA district office in the Tabora region and the COWSO members visited during the site surveys revealed a significant reduction in mainly abdominal pain and skin conditions after implementing this Project. Switching from hygienically unsafe water sources to using the deep wells installed in the Project has helped obtain higher quality water and eliminate abdominal pain and skin problems.

(2) Changes in women's working hours and children's learning time

Before implementing the Project, villagers - mainly women - mostly used to spend two to four hours²⁸ fetching water, especially during the dry season because the nearby water points used during the rainy season dried up. After the Project, the time required to fetch water was generally reduced to less than 30 minutes in the target areas, eliciting the following positive impacts, such as improved living, learning environment for children and so on.

- Change in working hours for women and associated livelihood improvement

Time freed up for agricultural activities, which had been spent on fetching water, helped boost crop yields and incomes. Moreover, allowing more time for family and leisure brought home the perception of comforts in their life to those involved.

²³ Comparison between the purchase of 25 litres of water from a water vendor and from water supply facilities in this Project

²⁴ Same as footnote 23

²⁵ Data stating the average monthly income of Tabora regions was not available, however, according to the Numbeo (<http://www.numbeo.com/>), a database recorded information on life in cities and countries worldwide, the average monthly income in 2020 was 442,204 Tsh (approximately 20,560 yen) in Tanzania.

²⁶ Source: National Bureau of Statistics (2019), *Key Indicators Report 2017-18 Household Budget Survey*

²⁷ In case reference is made to the "monthly average meal cost per adult" (41,473 Tsh), obtained as a variable from the Tabora region, the reduction in cost of purchasing water is equivalent to between 5 and 27% of the monthly average expense on meals and is thus expected to have a certain impact on cost reduction efforts for household expenses.

²⁸ Based on interview surveys with COWSO members and villagers using water facilities during site visits

- Improved studying time and study environment for children

According to villagers in the target areas, children had more time to study thanks to the reduced time required to fetch water. It was also confirmed in some villages that villagers did not let children go and fetch water for safety reasons, since this often took them several hours during dry season before the Project. In such areas, although no changes in the working hours for children were reported, cases of mothers spending less time on fetching water and more time supporting their children with their studies were reported. In either case, it can be said that reducing the time required to fetch water helped improve the study environment for children.

(3) Fostering the ownership of villagers

Implementing this Project can be said to have helped establish a community-based O&M mechanism of the water supply facility, which had not existed before, by forming a COWSO in each village where the water supply facility was established. COWSO is responsible for collecting and managing water charges required for O&M, monitoring the condition of each water supply facility and reporting those conditions to the RUWASA district offices. The mechanism continued for a certain degree, even after the Project was completed. By way of explanation, forming COWSOs and providing training helped deepen the understanding to pay the maintenance cost of water supply facilities at their own cost and went a long way to helping sustain the mechanism. Though it is confirmed that some COWSOs do not collect water charges regularly and have changed the collection system to collect the necessary amount from villagers when damage occurs, the RUWASA district offices need to continue communicating with COWSOs and provide adequate advice on the best ways to collect water charges to ensure the sustainable operation of water supply facilities.

[BOX] Contribution of this Project from the perspective of the United Nations Sustainable Development Goals (SDGs)



This Project was implemented to improve access and water supply coverage to safe water by constructing deep wells, procuring groundwater development equipment and improving the capacity to conduct O&M of water supply facilities in the Tabora region with lower water supply coverage nationwide. This purpose is to contribute to the “Goal 6. Ensure availability and sustainable management of water and sanitation for all” of the SDGs adopted by the United Nations in 2015. In addition, installing wells in the neighbourhood have reduced the time required for women and children to fetch water, helping reduce the proportion of unpaid working hours and dovetails “Goal 5. Achieve gender equality”. The following figure shows how the output and effects of this Project match those of the indicators specified by SDGs^{Note}, so improving the same indicator due to the implementation of this Project is considered to help achieve the SDGs goal in Tanzania.

Output		Effectiveness • Impact (Indicators)		SGDs (Indicators)
• Construction of water supply facility • Procurement of groundwater development equipment	→	• Increase in water population and water supply coverage • Increase of use of safe and clean water • Reduction of time for fetching water	=	• Achieve universal and equitable access to safe and affordable drinking water (Goal 6.1, Indicator 6.1.1) • Proportion of time spent on unpaid domestic and care work (Goal 5.4 Indicator 5.4.1)
• Training for establishing the O&M system	→	• Sustainable O&M of facility by community based O&M of water supply facilities	=	• Support and strengthen the participation of local communities in improving water and sanitation management (Goal 6.B, Indicator 6.B.1)

Figure Consistency of Logic between this Project and SDGs

Note: The SDGs comprise 169 targets for 17 goals to realize a sustainable world and 244 global indicators set to measure the progress.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the natural environment

At the time of planning, the Tabora Regional Secretariat conducted a Preliminary Environment Assessment on each of the planned facilities in accordance with the Environmental and Social Management Framework of the Ministry of Water. As a result, the impacts to be generated by this Project were deemed negligible. Through questionnaires and interviews with the executing agency, it was confirmed that there was actually no negative impact on the natural environment during the construction works as well as after the provision of the facilities.

(2) Resettlement and land acquisition

Temporary acquisition of some cropland during the construction period was planned for some sections of the distribution pipe when implementing this Project. However, it was expected that cultivation was carried out during the rainy season while the construction work was limited to only during the dry season, and the land was recovered for agricultural use after construction. Accordingly, the impact on harvesting and income is assumed to be negligible and no land acquisition would be required. In fact, in areas of temporarily affected cropland, the villages provided alternative land and no cases of resettlement and land acquisition were confirmed. Moreover, since water supply facilities were installed on national land, no resettlement or land acquisition was required when constructing the same.

As described above, this Project has mostly achieved its objectives. Therefore, effectiveness and impacts of the Project are high.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional/Organizational Aspect of Operation and Maintenance

(1) Supervisory authority of the rural water supply

The organization overseeing water supply projects and O&M of rural water supply facilities shifted from LGAs to RUWASA following the enforcement of *the Water Supply and Sanitation Act, 2019* as described above. Most of the staff overseeing the rural water supply at LGAs (district/municipality) were transferred to the RUWASA Tabora regional or district offices. The reporting systems of the Ministry of Water, RUWASA regional offices and each village were generally adequate. However, as shown in the Table below, there is a shortage of personnel at each office and reportedly there are also some cases in which a timely response to support requests from the field is not always received. Accordingly, some concerns remain in terms of the institutional aspect of the O&M.

Table 7 Number of O&M staff of the RUWASA Regional and Each District Office

	Engineer		Technician	
	Set number	Placed number	Set number	Placed number
Tabora region	5	3	0	0
Igunga	4	3	10	4
Nzega	3	1	15	5
Sikonge	3	2	10	6
Tabora district/municipality	2	2	9	4
Urambo	4	2	6	3
Kaliua	6	1	12	4

Source: Questionnaire answer from RUWASA Tabora regional office

Note: While engineers are qualified, technicians have the necessary technical skills or have learned the required technology. In local authorities, although engineers had to be assigned to regional offices, this did not necessarily apply to technicians.

(2) O&M of Level 2/Level 1 water supply facility

The COWSO at each village oversees the O&M of the water supply facilities. Each COWSO comprises eight to 12 persons, including representatives, a secretary and accountant and must be replaced every three years. COWSOs understand the operational conditions of the facilities, water charges collected and the presence of problems, etc. and periodically (monthly, or quarterly, etc.) report to the RUWASA district offices via phone or on paper, whereupon district offices compile information and submit a monthly report to the RUWASA Tabora regional office. While most of the COWSOs oversee the O&M of water supply facilities on their own initiative until the time of the ex-post evaluation, RUWASA explained that the number of villages with less involvement in O&M of COWSO has gradually increased in recent years. This was attributable to less understanding on the part of new villagers having moved in and less motivation on the part of COWSO members who undertook such work unpaid. It was also confirmed that monitoring of the circumstances of the water supply facilities conducted by district offices was based on information reported from the field (COWSOs), rather than on-site inspections, due to shortages of staff and the necessary travel means for monitoring²⁹.

(3) O&M system of groundwater development equipment

The O&M of the equipment is conducted by the hydraulic geology department of the Tabora Branch of Lake Tanganyika Basin Office and has remained unchanged since the planning stages. The total number of office staff at the ex-post evaluation was nine, five of whom were engineers. A shortage of personnel to implement groundwater development surveys across the Tabora region was reported and is said to be a concern from an institutional perspective.

3.4.2 Technical Aspect of Operation and Maintenance

(1) O&M of the water supply facility: Technical capacity of COWSO

The COWSO members include technicians with basic knowledge who participated in O&M training while implementing this Project and could handle basic maintenance activities such as minor failure, replacement of consumables including packing, greasing of bearings, cleaning and so on. It was confirmed through the RUWASA district offices, interviews and the operational conditions of the facilities during site surveys that Level 1 water supply facilities could actually be maintained and managed. Conversely, when repairs which COWSOs cannot handle occur, such as failures of generators or equipment of the Level 2 water supply facility, breakage of pipes of Level 1 water supply facility, etc., COWSOs report to the RUWASA district offices, whereupon engineers from the district offices can follow up. Accordingly, no serious problems when conducting O&M of the water supply facility were confirmed.

²⁹ None of the RUWASA district offices in the Tabora region has any vehicles for monitoring, so monitoring takes place via motorbikes or bicycles.

(2) Monitoring and guidance to COWSO: RUWASA Tabor regional and each district offices

At the time of planning, the Department of the Rural Water Supply in the Ministry of Water, which was an executing agency, had the capacity to formulate water supply plans and design facilities and boosted this capacity through training opportunities supported by Japan and developing partners as well as technical support and guidance to LGAs. In addition, each district/municipality had water engineer offices where water engineers, equivalent to engineer level and technicians were assigned, then supported the O&M of water supply facility in the villages. As mentioned above, although RUWASA oversees the O&M of the water supply facility in rural areas at the time of the ex-post evaluation, staff members from the former water engineer offices have been transferred to the local RUWASA offices, so their knowledge and skills have been inherited. Therefore, there are no serious concerns over the capacity of local offices in RUWASA to provide the technical guidance and monitoring. Though scope to implement monitoring remains limited due to shortages of transportation means and personnel, in case the offices receive the reports on failures, etc. from COWSOs, they visit the site as much as possible, determine the circumstances and provide the necessary support³⁰.

(3) Maintenance of equipment: Technical capacity of the Tabora Branch of Lake Tanganyika Basin Office

The Tabora Branch of the Lake Tanganyika Basin Office was commissioned by the local governments and NGOs to conduct a geological survey. Since the number of survey cases was increasing at the time of planning, it was considered that they already had the required skills from those days. Furthermore, with regards to the newly procured equipment, there were no concerns over the technical aspects of O&M, since the staff members who participated in the Project training were in the office, except for one person retired and the procured equipment (resistivity, etc.) was effectively utilized. It was confirmed that the distributed O&M manuals were placed in the office and used as needed.

3.4.3 Financial Aspect of Operation and Maintenance

(1) O&M cost of the water supply facility

● Level 2 water supply facility

A system that charges 50 Tsh (about 2.3 yen) per 20 litres has been applied and the water charges have been collected without any problem. Conversely, the expense depends on whether commercial power or a diesel generator is used. In each COWSO of Mabama and Kakola, which uses diesel generators, the cost of fuel is high, which means only the minimum O&M cost can be covered and support has to be requested from the RUWASA district offices if large-scale

³⁰ Interview survey to the RUWASA Tabora Regional office, each district office and each COWSO members

repair needs and failures emerge. In addition, Kakola suffered from a vicious circle, in which COWSO failed collect the planned water charges due to leakage from public taps, and to secure the maintenance cost to conduct necessary repair works.

Table 8 Balance of COWSO with Level 2 Water Supply Facilities Installed

Target village	Status of balance for maintenance cost
Isanga	A commercial power supply is used and the O&M cost can be covered by collected water charges.
Mpumbli	The water supply was suspended till the previous month of conducting the ex-post evaluation, so no water charges were collected.
Mabama, Kakola	Diesel generators are used because the high-pressure power lines did not extend to the villages and only the minimum water charges for fuel and maintenance were collected. The amount of water charges collected did not reach the planned amount due to leakage from public water taps.

Source: Interview survey to members of each COWSO

● Level 1 water supply facility

At the Level 1 water supply facility, a system that charges a certain amount monthly per household (from about 500 to 2,000 Tsh (approximately 25 – 100 yen)) is applied. At the time of the ex-post evaluation, it was confirmed that no water charge was collected from just under 60% of COWSOs³¹. Since this number was about 30% at the time of the defect inspection survey conducted one year after project completion, it showed a tendency of increase. Although maintenance of the Level 1 water supply facility was not particularly costly, many COWSOs with the inability to collect water charges revised the water charge collection system to levying charges when repair was required rather than accumulating O&M funds monthly. This change means that if the accumulated O&M funds decline, it is impossible to perform repairs quickly when the water supply facilities malfunction, raising concerns over possible temporary operational stoppages of the water facilities, for which RUWASA must consider measures. The revision to the water charge collection system was deemed attributable to the fact that the agricultural activity as an only source of cash income was limited especially in dry season and payment was delayed, and that the collection work of COWSO members became a burden on the households. In addition, in a few cases, the way in which the collected funds were used was unclear, since the initial COWSO members did not fully understand the significance and importance of collecting water charges, meaning the collected money was improperly managed. Current members of COWSOs, in which such problems arose, questioned the quality of the initial members selected and emphasized the need for a careful selection process.

³¹ 19 out of 33 COWSOs in villages with Level 1 water supply facilities installed in this Project. The situation differed between districts/municipalities. In villages within Sikonge, Tabora rural, Urambo, Kaliua and Tabora municipality, water charges were regularly collected by all COWSOs, except one COWSO in the Tabora municipality while the charges were collected when needed via COWSOs in each of Igunga and Nzega villages.

(2) Budget of RUWASA/LGAs

The water sector budget and expenditure for the past two years of LGAs overseeing the O&M of rural water supply and the budget of RUWASA in 2020 are shown in the Table below. The actual spending of each district was substantially lower than the planned budget, by about 20% on average. While the budget execution rate in Tanzania was generally low, the RUWASA staff cited a clear shortage of funding for proper O&M activities and monitoring, which was the main reason why sufficient transportation means could not be arranged, monitoring activities were not conducted regularly and so on.

Table 9 Budget and Expenditure of Water Sector in Districts/Municipalities where Water Supply Facilities were Installed

District/Municipality	LGAs				(million Tsh)
	2017/18		2018/19		RUWASA
	Budget	Expenditure	Budget	Expenditure	2020
Igunga	263	68	963	343	2,625
Nzega	648	101	3,257	306	3,565
Sikonge	983	425	1,810	85	2,623
Tabora rural	1,009	289	1,402	427	2,362
Tabora municipality	2,216	15	1,385	831	82
Urambo	465	9	1,361	2	2,230
Kaliua	1,049	347	1,521	6	2,433

Source: Documents provided by RUWASA Tabora Regional office

(3) O&M cost or equipment

Information on the budget of the Tabora Branch of the Lake Tanganyika Basin Office which is overseeing the O&M of the groundwater development equipment, could not be obtained during either the site surveys or the follow-up survey. Until 2019, the branch's budget was managed by the Kigoma office of the Ministry of Local Government of the President's Office, given the inability to access information from Dodoma, the capital, and Tabora region, the target area, which were visited during the ex-post evaluation. Conversely, it was reported that the equipment was not fully utilized at the time of the ex-post evaluation due to inability to secure sufficient funding to update the software required to use the two-dimensional resistivity survey equipment. Accordingly, it can be said that a lack of maintenance cost affected sustainability. According to the Ministry of Water, the RUWASA has already planned to dispatch IT experts since the management of the office shifted to RUWASA and proceed to respond with an upgrade of software, meaning specific action for future improvement was confirmed.

3.4.4 Status of Operation and Maintenance

In the Tabora region, water shortages in the dry season will seriously impact on the lives of villagers. Accordingly, they themselves are very aware of the importance of the water supply facility and the O&M of the facility is generally effectively maintained as follows:

(1) O&M status of water supply facility

- Level 2 water supply facility

The O&M status of each water supply facility is shown in the Table below. Among four villages where the Level 2 water supply facility was installed, no problems or defects affecting the function of water supply were identified in Isanga, Mabama and Kakola. In Mpumbli, generator faults were repaired three times thanks to support from the RUWASA district office, but the operation was stopped for one year due to the repeated subsequent failures. However, the repair had been completed and water was supplied without any problems at the time of the ex-post evaluation. In addition, leakages of public taps were confirmed at Kakola. Though the valves need to be replaced, funding the repairs was not possible, given the inability to collect the planned water charges due to the water leakage as described above. Accordingly, repair measures must be examined while requesting support from RUWASA.

Table 10 O&M Status of the Level 2 Facility

Isanga	Good condition. There have been no problems which affect water supply.
Mpumbli	Good condition. However, the operation was stopped till a month before the site survey was conducted during the ex-post evaluation because the water was improperly pumped due to a generator failure. The generator has already been fixed thanks to support from the district office. It was later confirmed that the facility was being utilized without issues in a follow-up survey conducted by the local associate.
Mabama	Good condition. There have been no problems affecting the water supply.
Kakola	The battery is aging and sometimes stops working, in which case water is supplied using the battery of the village. In addition, water leaks from all public taps cause a mismatch in revenue received compared to the amount of water supplied.

Source: Interviews to each COWSO members

- Level 1 water supply facility

The utilization rate of the Level 1 water supply facilities installed in this Project was good and about 95%. While water supply facilities were used in the dry season because the neighbouring water sources had dried up, villagers also used nearby traditional water sources during the rainy season. Thus, it was confirmed that the use of the facilities differed between dry and rainy seasons in some villages. This is due to the fact that the water charges were waived for those not using the water supply facility and that there was a widespread lack of hygiene awareness. Regarding the facilities inspected during site visits, two cases involving theft of pump heads and handles in the

Uyui district as well as some facilities where water could not be pumped due to wear of rubber were confirmed. In addition, the installation of a fence around the water supply facilities to keep livestock away and secure hygiene conditions was proposed at the defect inspection survey conducted one year after the project completion. However, at the site survey, it was confirmed that the fence had only been installed in a few facilities³². According to interview surveys with villagers and RUWASA district offices, although no damage from domestic animals was reported, the RUWASA Tabora regional office is thinking of reminding COWSOs to install fences to maintain hygienic conditions.

The major O&M of the Level 1 water supply facility comprised simple works such as replacing consumables due to wear and tear, inspection of sand clogging, cleaning and so on, most of which were done by COWSO members. Consumables and spare parts were also locally available. Support from the district offices was necessary to replace the pipes and respond to failures that could not otherwise be handled while there were concerns that the RUWASA district offices may be unable to respond quickly due to lack of manpower and transportation means.

(2) Equipment (electromagnetic survey equipment • resistivity survey equipment • GPS)

GPS is used frequently, but the resistivity survey equipment was used only about ten times a year. After being procured, the equipment was used more than 20 times a year until the time of the defect inspection. However, since the budget was insufficient to update the necessary software, old resistivity equipment (only alignment can be grasped in 1D), which was in operation before the new equipment was procured, was used. The resistivity equipment procured in this Project is capable of determining terrain in two dimensions (2D), which was impossible with the old model. Since the equipment provided by the Project is the only 2D-based equipment available in the country, an action must be taken as soon as possible.

(3) Effects generated by implementing a soft component: Contribution to sustainability

In this Project, technical assistance (soft component) on “O&M of water supply facilities” was carried out to ensure the effects of the Project could be sustained. Regarding the contribution and challenges involved in supporting the capacity to maintain and manage water supply facilities, COWSO members and staff of the RUWASA Tabora regional offices made the following comments:

- Contribution to the community-based O&M of water supply facilities

COWSOs were formed at all target villages through the activities of the soft component. After

³² According to the RUWASA Tabora regional office, fences installed by COWSO after receiving the proposal at the defect inspection survey were made of wood and often subsequently rotted. In future, RUWASA is planning to remind COWSOs of the need to install fences.

water supply facilities were installed, collection and management of water charges which was not done before, the O&M such as necessary repairs and so on have been conducted mainly by COWSOs, which can be explained as effects of the soft component. However, three years after establishment, the number of COWSOs where the activities start to stagnate has been also increasing at the time of the ex-post evaluation. Therefore, it can be said that the follow up by RUWASA to implement continuous activities in the future is necessary.

- Improvement of community support mechanism by local authorities

Each RUWASA district office has staff members to communicate with COWSOs and handle sanitation. Many also have experience and have been involved in implementing trainings for COWSOs under this Project. Monitoring of the O&M status of water supply facilities and follow-up on COWSO activities were conducted by leveraging this experience. After completion of the project and also at the time of the ex-post evaluation, though the actual number of visits was limited due to a lack of transportation means and staff, routine communications were made via phone, etc. In case any serious issues or concerns occurred, the district offices staff members visited the sites and took appropriate measures.

- Improvement of a system for awareness of health and hygiene on “water and hygiene” within target communities

In interview surveys conducted at the site survey, the villagers answered that training under this Project helped deepen their understanding of the importance of using safe water and insights into its impact on health. According to each RUWASA district office, the villagers were unaware of all the types of waterborne diseases and prevention methods as well as the harm to health caused by groundwater fluorine. However, the villagers understood that using water from the water supply facilities installed in this Project would alleviate issues like abdominal pain, reflecting their understanding of the importance of using safe water as learned in training. Conversely, some villagers still reportedly used traditional water sources in rainy season as described above. According to staff from the RUWASA district office and COWSO members, the knowledge gained through awareness-raising activities could not be completely understood in one or two training sessions, and it is hoped that RUWASA will continue to conduct hygiene training at the required timing and frequency.

As described above, some minor problems have been observed in terms of the institutional/organizational and financial aspects as well as current status of O&M. Therefore, sustainability of the Project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This Project was implemented to increase the population served of the water supply and the water supply coverage in the Tabora region of Tanzania by constructing water supply facilities and procuring equipment, thus helping improve the living environment of the target areas. Its purpose is in line with the development policy and sector plan of Tanzania, which emphasizes efforts to improve access to safe water in rural areas and the need to develop water supply facilities, in addition to Japanese aid policy. Accordingly, the relevance of the Project is high. Both the project cost and period were within the plan, thus the efficiency of the Project is also high. The water supply facilities constructed in this Project have significantly increased the population served of water supply and water supply coverage in the target areas, as well as reducing the cost to purchase water. The incidence of waterborne diseases has also declined due to the use of clean water. Reducing the time of fetching water has boosted the amount of agricultural activity women can do and helped improve their lives. In addition, despite some issues, the COWSOs established through this Project are involved in community-based O&M of water supply facilities and so on, so the effectiveness and impact of this Project are high. In terms of sustainability, however, some minor problems have been confirmed in institutional/organizational and financial aspects as well as maintenance status. The problems include a shortage of personnel to monitor water supply facilities and COWSOs, and the decreased involvement of COWSOs in O&M and water charge collection work. Accordingly, the sustainability of the Project effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Recommendation to RUWASA

- Water tariff collection for Level 1 water supply facilities is declining and RUWASA says it is considering applying a pay-as-you-go system to Level 1 water supply facilities in future, like that applied for Level 2 water supply facilities. Conversely, villagers who remain reluctant to pay water charges at present, or who are not fully aware of the importance of accessing to clean water, may rely more frequently on traditional water sources. When considering changes to the collection system, RUWASA is considering setting rates and awareness-raising activities conducted under the soft component of this Project. Continued follow-up work is required to bring home to residents the importance of using sanitary water.

Recommendation to COWSO and RUWASA

- More and more COWSOs have changed the system for collecting water charges for Level 1 water supply facilities from regular collection to collection on an as-required basis. There is

concern that the system of collecting fees when failure occurs and responding to them on a case-by-case basis is likely to take some time to repair and restart, and that villagers may not be able to obtain safe water during this period. Accordingly, it is desirable for COWSOs to set aside certain reserves so that they will always have a system in place to respond quickly in the event of a breakdown. RUWASA will need to take follow up actions such as explaining to COWSOs about the importance of reserve fund and a regular fee collection system to secure such a fund.

Recommendation to the Tabora Branch of Lake Tanganyika Basin Office

- With regard to the procured resistivity survey equipment, despite the acknowledged needs, the software has not been fully updated and utilized due to lack of budget. The equipment provided by this Project is the only 2D-based survey equipment available in the country and is particularly urgently needed in Tabora region, where aquifer identification and borehole drilling are considered difficult. Although RUWASA is already in the process of arranging an IT person to verify the necessary information to secure the budget, the software will need to be regularly updated, not just this time. Therefore, it is advisable that the Tabora Branch of the Lake Tanganyika Basin Management Office confirm the frequency and amount of updates required as soon as possible and report back to RUWASA to receive the necessary budget allocations for continued use.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

- Selection of core members of the community organization considering sustainability

In this Project, COWSOs overseeing the O&M of water supply facilities and the collection and management of water charges were formed and COWSO members comprising five to eight persons were selected at that time. Subsequently, a few cases in which COWSOs did not accumulate and deposit the collected money properly were confirmed. The villagers explained that COWSO members did not clarify the usage or manage the funds properly. It was also pointed that the selection process and criteria for members were not sufficiently clarified at the time of establishment, underlining the need for careful selection of members after properly explaining the significance of the proper organizational management when selecting members. In future, if there is a need to select members of community organization as part of the project, it will be preferable to select members by clarifying the selection criteria and adopting a fair and transparent selection process.

- Flexible response considering the achievement of the output

Since the ground is mostly comprised of base rock in the Tabora region, it was regarded as a very difficult area to drill boreholes technically. In fact, the success rate of the initial stage of drilling boreholes under this Project was very low and there were concerns over whether the planned number of boreholes could be drilled within the assumed period. During this Project, however, it was possible to achieve the planned output within the period through a flexible approach by relocating the boreholes drilled and revising the success criteria (water quality/quantity), while taking the impacts on the whole target area and on the project stakeholders into consideration. In cases where the output was not expected to be achieved as planned, it is desirable for the related stakeholders to carefully examine the effects caused by the change of plans and respond with required changes swiftly and flexibly toward the realization of ultimate effects of the project.