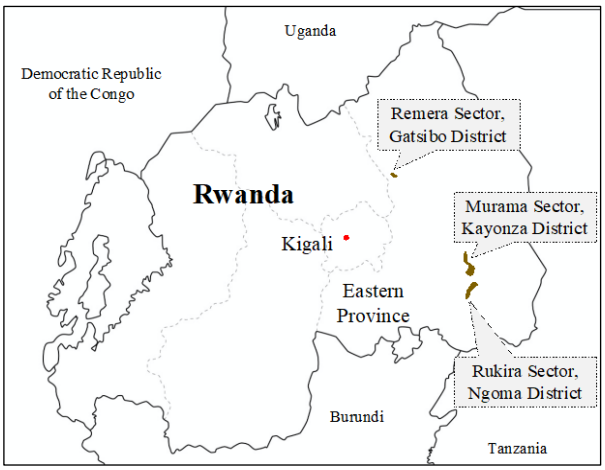
FY2020 Simplified Ex-Post Evaluation Report of Japanese Grant Aid Project

External Evaluator: Takako Haraguchi, i2i Communication, Ltd. (January 2022)
Duration of the Study: December 2020–January 2022
Duration of the Field Study: 16–22 March 2021, 15–24 April 2021[1]

Country Name	The Project for Rural Water Supply (Phase III)
Republic of Rwanda	



Location of the Project site

Public water tap (Murama Sector, Kayonza District)

I. Project Outline

Background

In Rwanda, many of the people live in hilly areas where water sources are scarce. Water sources for rural water supply were mainly springs, lakes, and rivers. However, the poor quality of water and the time required to fetch water from distant areas presented additional obstacles to rural development. In its national development plan, "Vision 2020" (formulated in 2000), the Rwandan government set a goal of achieving 100% access to safe water by 2020. However, as of 2011, the national rate of access to safe water (the percentage of population served) was only 74.2%, with the Eastern Province having a particularly low rate of 66.6%.

The Japan International Cooperation Agency (JICA) has assisted in rural water supply since the early 2000s, mainly in the Eastern Province. The Rwandan government requested cooperation for sites that were not covered by the two grant aid projects, the "Project for Rural Water Supply" (Exchange of Notes (E/N) signed in 2006) and the "Project for Rural Water Supply (Phase II)" (E/N signed in 2010), and this project was implemented in response to that request.

Objectives of the Project

To improve access to safe water and the percentage of population served in the target areas of the Eastern Province by developing water supply schemes and enhancing maintenance capacity, thereby contributing to the improvement of the living conditions of people in terms of water and sanitation.

Contents of the Project

1. Project Sites: A total of four sites in Rukira Sector, Ngoma District[2] (two sites, Rukira East and Rukira West), Murama Sector, Kayonza District (one site), and Remera Sector, Gatsibo District (one site) in the Eastern Province
2. Japanese side:
   1) Civil works, procurement of equipment, etc. (The table shows actual results, with some changes in quantity from the plan.)

Facility		Site				Total
		Rukira East	Rukira West	Murama	Remera	
Intake Facility	Spring Intake Facility	1 unit	1 unit	2 units	-[a]	4 units
	Borehole Pit	-	-	-	3 units	3 units
	Conveyance Pipeline	-	0.1 km	0.1 km	-	0.2 km
Transmission Facility	Receiving Tank	1 unit	1 unit	1 unit	1 unit	4 units
	Control House	1 unit	1 unit	3 units	4 units	9 units
	Balancing Tank	-	-	2 units	2 units	4 units
	Transmission Pipeline	0.8 km	0.4 km	3.7 km	4.6 km	9.5 km
	Chlorination Room	1 unit	1 unit	-[b]	1 unit	3 units
Distribution Facility	Distribution Tank	1 unit	1 unit	1 unit	1 unit	4 units
	Distribution Pipeline	5.5 km	9.6 km	28.1 km	14.4 km	57.6 km
	Monitoring Room	-	-	1 unit	1 unit	2 units
	Break Pressure Tank	1 unit	-	5 units	2 units	8 units
Water Service Facility	Public Water Tap	7 units	16 units	25 units	27 units	75 units

[a] Distribution pipelines from the existing spring water were connected to the receiving tank.

[1] Due to the new coronavirus pandemic, the fieldwork was conducted remotely from Japan. Specifically, under the direction of the ex-post evaluator, a local assistant located in Kigali conducted interviews with the executing agency and related organizations and made site visits.
[2] Rwanda's local administrative divisions are province, district, sector, cell, and village.

	[b] A chlorine injector was installed in the Control House. 2) Consulting service / soft component: Bidding assistance and implementation supervision for the works described above, assistance for the installation of Water Service Providers (hereinafter referred to as "WSPs") and Water User Committees (hereinafter referred to as "WUCs"), and sanitation awareness activities, etc. 3. Rwandan side: Securing lands for planned water supply facilities, explaining to and obtaining consents from water source users, supplying safe drinking water to the users of existing water source facilities during construction, and selecting, executing contracts, managing WSPs at the target sites, etc. by the districts.

Implementation Schedule	E/N Date	March 5, 2015	Completion Date	July 20, 2017 (start of operation)
	G/A Date	March 5, 2015		
Project Cost	E/N Grant Limit / G/A Grant Limit: 1,013 million yen, Actual Grant Amount: 1,008 million yen			
Executing Agency	Water and Sanitation Corporation (WASAC)			
Contracted Agencies	Main Contractor: Tone Engineering Corporation Main Consultant: Nihon Techno Co., Ltd.			

II. Result of the Evaluation

Summary

The relevance is high, as the project objective was consistent with Rwanda's development plan and development needs and Japan's ODA policy at the time of the ex-ante evaluation. The outcome "to improve access to safe water and the percentage of population served" was achieved, as both the amount of water supply and the population served in the target areas exceeded the targets. The intended impact, "improvement of the living conditions of people in terms of water and sanitation," also seems to have been achieved based on the responses from the executing agency, although data were not available. Therefore, the effectiveness and impact are high. Efficiency is fair, as the project period exceeded the plan. Sustainability is high. The institutional/organizational, technical, and financial aspects of operation and maintenance have been established. Although some minor problems were observed in the current status of operation and maintenance and there was flooding near some of the facilities, these issues affected only a small part of the entire project. Thus, it was judged that the sustainability of the project effects in the future would not be undermined.

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

Overall Rating[3]	A	Relevance	③[4]	Effectiveness & Impact	③	Efficiency	②	Sustainability	③

<Special Perspectives Considered in the Ex-Post Evaluation>

- The project objective was stated in the ex-ante evaluation sheet as "to develop water supply schemes and enhance maintenance capacity in the Eastern Province, thereby contributing to the improvement in access to safe water and the percentage of population served in the province." However, based on the logic of the project, "to develop water supply schemes and enhance maintenance capacity" was classified as an output, while an "improvement in access to safe water and the percentage of population served" was classified as a direct outcome. With respect to the impact (indirect outcome), the qualitative effects "reduction in the burden of fetching water" and "reduction in waterborne diseases" stated in the ex-ante evaluation sheet are appropriate in light of the details of the project. These are also considered to be synonymous with "improvement of the living conditions of people in terms of water and sanitation," which was set as an impact in the ex-post evaluation (2016) of the "Project for Rural Water Supply/Project for Rural Water Supply (Phase II)," and this wording was used in this project as well.
- The quantitative effects were judged primarily based on the achievement level of the two indicators, "the amount of water supply in the target areas" and "the population served in the target areas," which were set at the time of the ex-ante evaluation. In addition, "the percentage of population served" and "safe water" (water quality), which are mentioned in the project objective above, were also examined as supplemental information.

1 Relevance

<Consistency with the Development Policy of Rwanda at the Time of Ex-Ante Evaluation>

This project was consistent with the development plan at the time of the ex-ante evaluation. In addition to the "Vision 2020" stated in the "Background" section above, the water sector was regarded as one of the national priorities in the "Second Economic Development and Poverty Reduction Strategy" (2013–2018). "The National Policy and Strategy for Water Supply and Sanitation Services" (2010) also defined the fundamental components of Rwanda's water policy, including the definition of the safe water access rate (the percentage of population served) (as the percentage of people who can access improved drinking water supply points (piped water supply schemes, protected wells, protected springs, and rainwater harvesting facilities, which meet the World Health Organization (WHO) Guidelines for Drinking Water Quality) located within 200 meters in urban areas and 500 meters in rural areas).

<Consistency with the Development Needs of Rwanda at the Time of Ex-Ante Evaluation>

As stated in the "Background" section above, this project was consistent with the need for access to safe water in the Eastern Province at the time of the ex-ante evaluation.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

This project was consistent with Japan's ODA policy at the time of the ex-ante evaluation. "The Country Assistance Policy for the Republic of Rwanda" (April 2012) designated "Social Service Improvement (Safe Water Supply)" as a priority area and provided comprehensive

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

[4] ③: High, ②: Fair, ①: Low

assistance by combining various schemes, focusing on the Eastern Province where the percentage of population served was lower than other provinces.[5] The project is also consistent with the Japanese government's announcement at the Fifth Tokyo International Conference on African Development (TICAD V) (2013) that it would support an "improvement in access to safe water and sanitary conditions for 10 million people."

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Effectiveness>

The quantitative and qualitative effects have been realized as expected. Therefore, the direct outcome, "improvement in access to safe water and the percentage of population served," has been achieved at the time of the ex-post evaluation.

(1) Quantitative Effects

The project facilities were confirmed to be in operation at all sites during the field inspection. Quantitative indicators, the amount of water supply in the target areas (Indicator 1) and the population served in the target areas (Indicator 2), both exceeded their target values (Table 1). The actual amount of water supply is estimated by WASAC, the executing agency, based on the population served and water supply hours and is not necessarily the actual amount of water supplied. It still is a reasonable calculation to show "the access to safe water and the percentage of population served." On the other hand, as actual measurements based on meter reading, the data on the amount of water supply (nonpublic information) for some facilities were obtained from the WSP, which is entrusted with the operation and maintenance of water supply facilities by each district. The values were lower than the data provided by WASAC above.[6] WASAC believes that WSP data are potentially underreported and is conducting a fact-finding survey at the time of the ex-post evaluation.

The reason why both the amount of water supply and the population served exceeded the plan can be attributed to the fact that water was supplied to more areas than initially targeted in order to improve the percentage of population served (Table 2). In particular, in the Remera site, the district extended the water distribution pipelines and added three public water taps in 2000 with support from NGOs.[7] As a result, the percentage of the population served in the target sectors, by calculation, became 94.6%.

Factors affecting water consumption include the use of existing water sources and the level of water pricing. As for existing water sources, water from springs and rivers is still used, and there exists an existing piped water supply scheme at the Remera site with lower rates than the project facilities.[8] The water tariff for public water taps (per 20 liters) is set uniformly throughout the country according to the power source of the facility: 8 Rwandan Francs (RWF) for gravity flow type (electricity not used), 20 RWF with the use of commercial power supply, and 25 RWF with the use of generators. At the time of the ex-ante evaluation, none of the project sites had been electrified, and the community survey estimated that the affordable price for the residents of the target areas was 22 RWF, which was less than 25 RWF. For this reason, JICA recommended to the Rwandan side to electrify the target areas as soon as possible. The water tariff was 25 RWF for all sites immediately after the completion of the project. Then, the Rukira East, Rukira West, and Murama sites were electrified in 2018, and the tariffs were reduced to 20 RWF. The Remera site is not yet electrified, and the tariff remains at 25 RWF. In addition to the high tariffs, another issue in using generators is that WSPs sometimes do not provide sufficient water supply because they refrain from running their pumps to save fuel costs for generators. However, according to WASAC, the situation has improved in sites where water tariffs have been reduced. At the time of the ex-post evaluation, WASAC is conducting a study on the revision of water tariffs for rural water supply (e.g., setting different tariffs for different income groups).

The quality of supplied water is good. The recent measured values available meet the Rwandan water quality standards (in accordance with the WHO Guidelines for Drinking Water Quality) (Table 3). Measurement data for other sites were not available, but according to the respective WSPs, all measurements at the end of 2020 were within standards.[9]

(2) Qualitative Effects

Since the WSP selection system and WUCs installed through the soft component are functioning (see also "4 Sustainability"), it can be said that qualitative effects have manifested. This was also helped by the technical cooperation project, the "Project for strengthening operation and maintenance of rural water supply systems in Rwanda" (2015–2019), which established operation and maintenance systems

[5] JICA assistance projects other than this project: "Project for Rural Water Supply" (grant aid, 2006), "Project for Rural Water Supply (Phase II)" (grant aid, 2010), "Study for the Improvement of the Rural Water Supply in Rwanda" (development study, 2008), "Improvement of Water Supply and Sanitation in the South Part of Eastern Province" (technical cooperation project, 2007–2010), "Project for strengthening operation and maintenance of rural water supply systems in Rwanda" (technical cooperation project, 2015–2019), and Japan Overseas Cooperation Volunteers (Water Security Action Team (W-SAT)). "The Project for Rural Water Supply Services and Infrastructure Management Development" (technical cooperation project, 2021–2026) is also under preparation as of September 2021.

[6] For example, the amount of water supplied in the Remera site in 2020 is 20,262 m^3/year according to the WSP data, which equals to 56 m^3/day if divided by 365 days.

[7] The World Vision and Movimento Lotta Fame Mundo (MLFM).

[8] The existing springs and rivers at the Rukira West site (the project facilities are located near these) and the irrigation reservoir at Nyakanazi cell in the Murama site were identified during the fieldwork, and the water from all of these sources is free of charge. In addition, at the Remera site, there is a gravity flow type facility (one public water tap) installed by the district before the project implementation, which, unlike the project facility, does not use an electric pump, so water is available at a low cost (8 RWF). During the fieldwork, it was also pointed out that the usage of the project's public water taps installed near this public water tap was low.

[9] The water quality of one of the three boreholes installed at the Remera site should be noted as an issue. The water quality of this source was within the WHO Guidelines for Drinking Water Quality at the time of the ex-ante evaluation and detailed design. However, a water quality test was conducted because there were some changes in the smell and color of the water immediately after pumping just before the completion of construction. In the test, some items exceeded the Rwandan water quality standards (as for the cause, the report from the consultant of this project to JICA cites potential infiltration from other aquifers). However, after discussions during the defect inspection (2019), it was confirmed that the water could be used after mixing it with water from other sources to ensure safety. According to WASAC, the smell and color of this water source still exist at the time of the ex-post evaluation, but the test items that exceeded the water quality standards in quantitative tests are now within the standards, so if demand increases further in the future, the water will be mixed with water from other sources as explained above.

for WASAC, districts, and WSPs and strengthened their capacities.

<Impact>

The intended impact (indirect outcome) of the "improvement of the living conditions of people in terms of water and sanitation" has been achieved. The burden of fetching water has been reduced. According to WASAC and the target districts, although no data are available, the time and effort required to fetch water have been reduced since the water supply points became closer than before the project. With water available within minutes of their homes, women, who are primarily responsible for fetching water, can now spend more time on agricultural activities and income-generating activities (i.e., small businesses). Children no longer have to spend time fetching water before school. Waterborne diseases are also considered to have been reduced. Although data are unavailable again,[10] WASAC believes that access to safe water has reduced diarrhea, which in turn alleviated malnutrition.

No negative impact on the natural environment was observed.[11] WASAC and relevant local organizations responded that "no negative impact has occurred," and, given the nature of the project, it is unlikely that any negative impact would have occurred. There was no resettlement.[12]

In addition, WASAC and the local stakeholders reported that the water intake in this project was not detrimental to the users of the existing water sources other than the target residents. As a countermeasure, the design of this project ensures that there is enough water for use by nearby residents and discharge downstream.

<Evaluation Result>

This project has achieved its objectives. Therefore, effectiveness and impacts of the project are high.

Quantitative Effects

Table 1 Actual Results of Performance Indicators

Indicators		Baseline 2012 Baseline Year	Target 2020 3 Years after Completion	Actual 2019 2 Years after Completion	Actual 2020 3 Years after Completion
Indicator 1 Amount of Water Supply in the Target Area (m^3/day)	**Sector as a whole**	**954**	**1,618**	**1,810**	**2,044**
	Rukira	339	501	573	597
	Murama	266	479	459	492
	Remera	349	638	778	955
	Project facility only	**0**	**664**	**665**	**1,036**
	Rukira East	0	162	78	93
	Rukira West			90	142
	Murama	0	213	214	256
	Remera	0	289	283	545
Indicator 2 Population Served in the Target Area (person)	**Sector as a whole**	**47,693**	**80,894**	**NA**	**96,631**
	Rukira	16,948	25,035	NA	27,309
	Murama	13,307	23,970	NA	24,649
	Remera	17,438	31,889	NA	44,673
	Project facility only	**0**	**32,901**	**NA**	**48,938**
	Rukira East	0	8,087	NA	3,269
	Rukira West			NA	7,092
	Murama	0	10,663	NA	11,342
	Remera	0	14,151	NA	27,235
(Supplemental Information) Percentage of Population Served (%)	Sector as a whole (Total of 3 sectors)	66.6 (2011)	88.2	NA	94.6

Source: Ex-ante Evaluation Sheet, Preparatory Survey Report, data provided by WASAC

Note: Based on the contents of the indicators, Indicators 1 and 2 can be classified as operation indicators, and the percentage of population served can be classified as an effect indicator. Each indicator was calculated in the following way:

- Indicator 1: Target value = baseline value + planned amount of water supply. Planned amount of water supply = planned amount of water intake x (100% - 10% of unaccounted-for water). Planned amount of water intake (in case of a spring) = feasible water yield (spring water volume) (m^3/hour) x 24 hours x (100% - 25% for discharge to nearby residents and downstream of the intake point). Planned amount of water intake (in case of a borehole) = feasible water yield (pumping volume) (m^3/hour) x 12 hours x (100% - 25% for discharge to nearby residents and downstream of the intake point). Three of the four water sources in the Remera Sector are boreholes, and all other sites are springs. Actual values were estimated by

[10] The district health offices, which may have had data, could not be interviewed due to the constraints of the fieldwork.

[11] The guideline for environmental and social considerations applied to this project is "JICA guidelines for environmental and social considerations" (2010), and the environmental category is C.

[12] At the time of the ex-ante evaluation, it was confirmed in the fieldwork in the presence of the respective district, sector, and village experts that the locations of storage tanks, including intake facilities, control houses, public water taps, etc., were on lands owned by the target villages. They agreed on the use of the land and confirmed that no resettlement would occur. During the implementation of the project, there were some changes in the construction location of some of the facilities, but these changes were made for technical reasons such as the results of test drilling in the detailed design, as well as in response to the requests of the sector offices, village mayors and residents. Such changes were decided and implemented after re-consultation with these stakeholders.

WASAC based on the population served (Indicator 2) and water supply hours.

- Indicator 2: Target value = baseline value + planned population served of the project (amount of water supply / water supply rate of 20 liter/capita/day). Actual value = baseline value + population of the area covered by the project (aggregated at the village level).
- Percentage of the population served: 2012 data are the percentage of population served in the Eastern Province in 2011, according to the third Integrated Household Living Conditions Survey. Target value = target value of population served / target area population estimate. Actual value = actual value of population served (Indicator 2) / target area population.

Table 2 Areas Covered by the Project

Site	Plan	Result (March 2021)
Rukira East	Nyaruvumu Cell and Kibatsi Cell in Rukira Sector, Ngoma District	In addition to two cells on the left, Rubimba Cell in Kabare Sector, Kayonza District
Rukira West		Nyaruvumu Cell in Rukira Sector, and Gatonde Cell in Kibungo Sector in Ngoma District
Murama	Nyakanazi Cell, Muko Cell, Rusave Cell in Murama Sector, Kayonza District	As planned
Remera	Nyagakombe Cell, Kigabiro Cell, Butiruka Cell in Remera Sector, Gatsibo District	In addition to the left, Matare Cell and Remera Cell in Rugarama Sector, Nyagisozi Cell in Kageyo Sector, Cyabusheshe Cell in Gitoki Sector, Gatsibo District

Source: Preparatory Survey Report, WASAC, districts/WSPs

Table 3 Select Water Quality Measurements at a Water Supply Point in the Remera Site

Measurement Date	pH	Turbidity	Coliform (*E. Coli*)
	Standard: 6.5<pH<8.5	Standard: <5 NTU	Standard: 0 CFU/100 ml
September 25, 2019	6.6	2.81	0
December 22, 2020	6.5	2.58	0

Source: Documents provided by WSP

3 Efficiency

The outputs of this project were as described in "I. Project Outline - Details of the Project" above, and they were mostly produced as planned, although there were some design changes and additional construction works on the Japanese side. As for design changes, construction locations and the quantity of some facilities were changed due to condition changes during construction. The additional construction works, which were the protection works on the cut-earth surface of more than two meters (six places), were carried out as additional outputs covered by the grant aid. This was due to the fact that the scale of preparation works (securing lands for planned water supply facilities), which were carried out at the Rwandan side's expense, was larger than expected. The additional construction was carried out based on the consensus among stakeholders that protection works were necessary for the cut-earth surface and by considering the maintenance of the project facilities in the future. JICA determined that all of the changes and works above were appropriate. No particular problems were observed in this evaluation.

As for the inputs, the planned and actual project costs for the Japanese side were 1,013 million yen and 1,008 million yen, respectively. The actual cost, even including the additional construction works, was as planned (100% against the plan). The planned and actual project costs for the Rwandan side were one million yen and 22 million yen, respectively, according to available information. However, most of the actual cost was for taxes related to the purchase of materials, which were not included in the planned cost, while the actual cost of the notification fees for the Authorization to Pay (A/P) and the bank arrangement fees, which were included in the planned cost, were unavailable. Thus, no comparison could be made between planned and actual costs.

While the planned project period was 25 months from March 2015 to March 2017,[13] the actual project period was 29 months from March 2015 to July 2017 (excluding the period for the additional construction), exceeding the plan (116% against the plan). This was due to the fact that the process from bidding to the execution of the contract took longer than planned.[14]

In light of the above, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

4 Sustainability

<Institutional/Organizational Aspect>

The operation and maintenance system and staff assignment for this project have not changed from the plan made at the time of the ex-ante evaluation, and an adequate system has been established. The owners of the constructed water supply schemes are now districts, which supervise and oversee the water supply operations with technical support from the WASAC Rural Water and Sanitation Services. Water supply operations are conducted by WSPs (also known as Private Operators (POs) since they are currently outsourced to private companies), which are commissioned through a bidding process in each district, and users pay for water on a metered basis. The provision of water supply services and collection of fees at each water supply point is conducted by the tap manager, who is subcontracted by the WSP. In addition, the Water Users Committee (WUC), an organization representing the users of each water supply point, monitors the operation and maintenance of the water supply point and collects requests from users. The Rukira East site is located on the Ngoma District side of the border between Ngoma and Kayonza Districts, but because the water supply points are used mostly by villages in Kayonza District, the site is operated and maintained by the WSP contracted by Kayonza District. At the national level, WASAC deployed District Support Engineers

[13] While the planned project period was stated as 24 months in the Ex-ante Evaluation Sheet, the period was recalculated by including both the first and last months.

[14] The project completion date was defined as the start of operation in accordance with the framework of JICA ex-post evaluation. As of July 2017, the additional construction (protection works on the cut-earth surface) remained to be completed, but the construction of water supply schemes had already been completed. The water supply was commenced by conducting the water supply ceremony before the completion of the additional construction in response to the request from the Rwandan government. The completion date of the entire construction, including the additional scope, was October 31, 2017, which was 128% against the plan when this date is considered as the project completion date.

(DSEs) in 27 districts across the country, hiring 21 DSEs in May 2018 and six in May 2019. At the time of the ex-post evaluation, a DSE has also been assigned to each of the three target districts of the project.

Table 4 Staff Assignment for Operation and Maintenance of this Project (as of March 2021)

National level	・One person as the Head of the Operation and Maintenance Unit, WASAC Rural Water and Sanitation Services, and three DSEs (one per district)
District, Sector	・District: one person as the Water and Sanitation (WATSAN) officer ・Sector: one person as the Land Manager
Each site	・WSP: one person as the Branch Manager, one person as the Head of the Technical Team, one plumber, two pump operators, one billing officer, one tap manager (subcontracted) at each public water tap ・WUC: one group at each public water tap

Source: Documents provided by WASAC and each WSP

<Technical Aspect>

Technical skills required for the operation and maintenance of the project facilities have been established. According to WASAC, the skills required at each level are water engineering skills at the district level, civil engineering skills at the sector level, and administrative, technical (inspection, parts replacement), and financial skills at the WSP level (no specific skills required for WUC (residents)). As these are the requirements for personnel selection and deployment at all sites, it can be said that the necessary skills are in place. The technical cooperation project, "Project for strengthening operation and maintenance of rural water supply systems in Rwanda," mentioned above also supported the training of DSEs, developed guidelines, manuals, and training modules for the operation and maintenance of rural water supply facilities, and provided training to DSEs, districts, and WSPs.

As a mechanism to maintain operation and maintenance skills, for the central level (WASAC) staff, a capacity assessment is conducted annually, and training plans are developed and implemented according to the identified capacity gaps. At the district/sector level and WSPs, there are opportunities to participate in training at the central level each year. In addition, training is sometimes provided by Development partners. At the individual facility level, WASAC is planning to conduct training for WSPs and WUCs on service delivery and infrastructure maintenance.

<Financial Aspect>

Finances required for the operation and maintenance of the project facilities have been secured. It was assumed at the time of the ex-ante evaluation that WSPs' responsibility set forth in their contracts with the respective districts would be daily operations and minor maintenance and that the costs for major and medium-scale repairs and renewal of facilities would be supported by the respective districts and the central government. In addition, each WSP was to contribute a portion of its sales to the district's Water Account as royalties. At the time of the ex-post evaluation, these mechanisms were functioning. For major and medium-scale repairs and renewal of facilities, WASAC has developed and updated an inventory of rural water supply facilities. The project has also established a mechanism for the central government to secure the budget required for repairing and renewing facilities that have become obsolete or been damaged due to natural disasters, etc. (the mechanism for royalties and the inventory of rural water supply facilities were established with the support of the JICA technical cooperation project mentioned above).

While the revenue and expenditure data of WSPs could not be obtained due to restrictions on third-party disclosure, each WSP reported that they were able to recover their operation and maintenance costs from the water tariff revenue. No issues were found, as this was also confirmed by some of the disclosed data. In addition, 10% of the revenue was contributed by each WSP as royalties to the respective district. While WSPs reported that they were generally able to collect water tariffs from residents, as noted in "2 Effectiveness/Impact," if the records for the amount of water supply were under-reported by WSPs, the reported amount of fees collected and the amount of royalties paid would be less than the actual amount. For this reason, we need to wait until WASAC completes its investigation on this point (since the required amount has been secured, the rating will not be lowered due to this).

<Current Status of Operation and Maintenance>

The condition and operation/maintenance status of the project facilities is generally good. During the fieldwork, some problems were found, as shown in the table below. However, except for the problem of flooding at the Murama site, they are minor and can be addressed in the short term. As the flooding is not affecting the water supply at the time of the ex-post evaluation, this issue is not considered to be of such a magnitude as to impair the sustainability of the project effects in the future. Thus, the rating was not lowered due to this issue, although this is noted as an issue that needs to be addressed.

Regular maintenance (monthly) and routine maintenance (daily) are conducted at all sites. Spare parts are all readily available, and there is no difficulty in procuring them.

Table 5 Status of the Project Facilities (as of March 2021)

Rukira East	Good. The water tap on the plastic tank next to the receiving tank was damaged and leaking, but the operation is unaffected.
Rukira West	Generally good. Four out of the 16 public water taps are not cleaned well and have a risk of contamination. Some facilities are insufficiently protected and may be damaged by sedimentation.
Murama	Generally good. However, the adjacent facilities have the following problems. 1) They are flooded during the rainy season due to unexpected heavy rainfall due to climate change, which may cause damage to the control house in the future. 2) The padlock on the cover at the top of the intake facility has been damaged, and children are throwing stones and grass inside.
Remera	Generally good. Fences have been installed around the facility, but they are insufficient, sometimes allowing livestock to enter.

Source: Fieldwork

<Evaluation Result>

No major problems have been observed in the institutional/organizational, technical, financial aspects and current status of the operation

and maintenance system. Therefore, the sustainability of the project effect is high.

III. Recommendations & Lessons Learned

Recommendations to Executing Agency:

1) There is a possibility of under-reporting of the actual amount of water supply by WSPs. WASAC is recommended to complete the fact-finding being conducted at the time of the ex-post evaluation as quickly as possible to ascertain the exact amount of water supply.
2) As the Remera site is not electrified, water tariffs have not been reduced from the rate charged for using generators as the power source. It is recommended that WASAC explore the possibility of reducing tariffs through electrification and conduct a review of water tariffs for rural water supply as soon as possible based on the study being conducted at the time of the ex-post evaluation.
3) It is recommended that district governments manage the Water Account properly and that, in the event that the project facilities require repairs in the future, they make arrangements to ensure that the Account will be used as intended. In addition, in the event that repairs are required on a scale that districts cannot accommodate, WASAC is recommended to make arrangements to ensure that funds from the central government will be used as intended.
4) Issues were found in the maintenance status of some facilities. It is recommended that each district take the following actions as soon as possible.
   - Improving the drainage at the Murama site. Environmental authorities should take countermeasures against climate change, such as planting more trees.
   - Removing the sediment accumulated on the cover of the underground facilities at the Rukira West site.
   - Ensuring the cleaning of public water taps at the Rukira West site.
   - Replacing the padlocks on the intake facility covers and ensuring safety management at the Murama site.
   - Strengthening the fences of the intake facility and ensuring safety management at the Remera site.

Lessons Learned for JICA:

Points to consider when setting quantitative indicators

By considering the basis of its calculation, the target value of the indicator "amount of water supply" set in the ex-ante evaluation sheet appeared to represent the water supply capacity of the project facilities, which is more of an "output." It was not possible to read from the ex-ante evaluation sheet whether it was intended to define the effectiveness (outcome) goal as the full use of the entire capacity. In a project designed to improve facilities and equipment, there are typically two possible outcome indicators: (1) facility-based targets (the project facilities are completed and capable of performing their functions as planned) and (2) utilization-basis targets (the facilities are actually used at the expected level), but it was not possible to determine which of these two types of targets was intended for the indicator "amount of water supply" for this project. This evaluation attempted to verify the results based on the second type of target (however, since accurate measured values were not available, the results were verified based on estimated values). However, the past ex-post evaluations of JICA's rural water supply projects show that not many projects used "amount of water supply" as an indicator (many evaluations, including the ex-post evaluation of the current project's preceding project, used "population served" and "percentage of population served.").

When setting quantitative indicators for grant aid projects, JICA should distinguish between (1) facility-based indicators (facility capacity, maximum capacity, etc.) and (2) utilization-based indicators and set (2) as outcome indicators when (1) can only be considered as "output" indicators. In circumstances where the indicator "amount of water supply" in rural water supply projects can still measure the outcome of "ensuring access to safe water" through (1), it would be better to name the indicator as "water supply capacity" or something similar to distinguish it from (2).

Spring intake facility (left), receiving tank (right), transmission pipeline (foreground)
(Rukira Sector, Ngoma District (Rukira East))

Public water tap installed by the district by extending the distribution pipeline from the project facility
(Remera Sector, Gatsibo District)