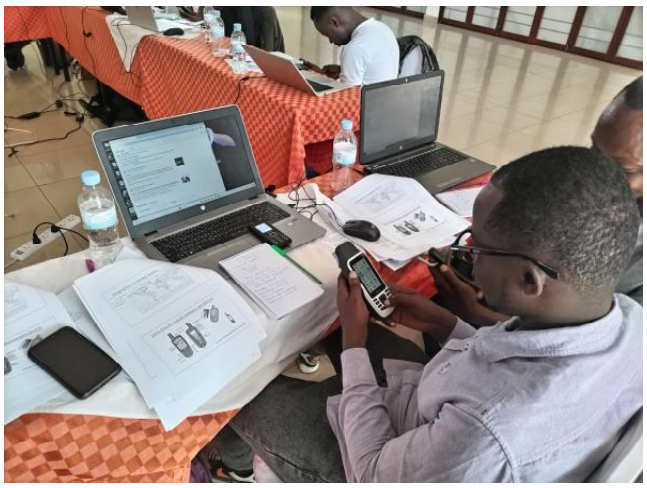
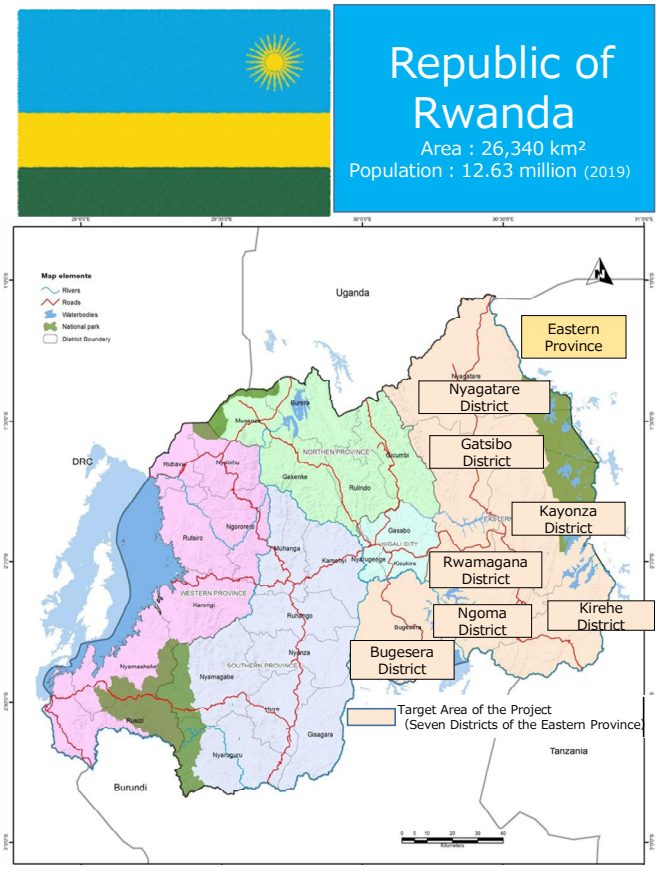
JICA Project Brief Note

The Project for Rural Water Supply Services and Infrastructure Management Development in Rwanda

May 2025
End of Phase 2 Activities





Project Target Area (Seven Districts in Eastern Province)

1. Background of the Project

1.1 Background of Project Implementation

The Government of Rwanda, in accordance with its "National Strategy for Transformation (2017)", has set a goal of providing safe water to the entire population by 2024. However, just under 60% of rural piped water supply facilities are operational; in rural areas, the rate of access to at least basic drinking water services is 60.0% (WHO/UNICEF, 2023). The low rate of operation for water supply facilities is largely attributable to the weakness of operation and maintenance (O&M) systems. The technical capacity of many Water Service Providers (WSPs) is not sufficient and O&M is not taken into consideration in the allocation of WSP budgets, resulting in many cases where pumps and other equipment that have broken down remain unrepaired due to a lack of funds and technical expertise. Furthermore, under a policy of decentralization, it was the responsibility of districts to provide support to WSPs. However, districts faced challenges due to insufficient technical and human resources, which hindered proper O&M. In response to these issues, the Government of Rwanda took steps in 2014 to strengthen support for WSPs by establishing the Department of Rural Water and Sanitation Services (RWSS) within the Water and Sanitation Corporation Ltd

(WASAC) to oversee rural water supply. In this way, a foundation was laid for improving O&M systems; however, the roles of WASAC RWSS, districts, and Private Operators (POs), the last of which are the outsourced contractors for facility O&M, were not clearly defined. Furthermore, the organizational structures within each entity were underdeveloped and, moreover, challenges persisted regarding technical capacity. In light of these issues, the Japan International Cooperation Agency (JICA) implemented the "Project for Strengthening Operation and Maintenance of Rural Water Supply Systems in Rwanda" (2015-2019) (hereinafter referred to as "RWASOM1") in four districts in Eastern Province. Through RWASOM1, national guidelines and manuals on the O&M systems of rural water facilities were developed. However, challenges still remained in updating and utilizing these guidelines and manuals, as well as in such areas as the adoption of Geographic Information Systems (GIS) for facility maintenance plans and water quality management. Furthermore, spring water facilities were outside the scope of RWASOM1. While spring water constitutes a critical water source, accounting for 38.9% of Rwanda's national water resources (NISR, 2022), due to the inadequate management of springs, water quality pollution has been observed, such as the detection of coliform bacteria. This has led to the proliferation of waterborne diseases and is considered a contributing factor to child malnutrition. Therefore, it has become imperative to further strengthen the planning and implementation capacity of rural water supply services, including the management of community water sources. This need has prompted the initiation of the "Project for Rural Water Supply Services and Infrastructure Management Development in Rwanda" (hereinafter referred to as the "Project").

1.2 Key Challenges in the O&M of Rural Water Supply Facilities

The current challenges facing the O&M of rural water supply facilities in Rwanda are outlined as follows.

Challenge 1: O&M Framework for Piped Water Supply Facilities Is Not Established

(1) Lack of an Established Institutional Structure Between WASAC, Districts, and POs

In RWASOM1, a national framework for the O&M of rural water supply facilities was developed, clarifying the roles and responsibilities of stakeholders and outlining procedures for water quality monitoring. At the time, districts owned the facilities and contracted with POs to handle day-to-day O&M. However, with the enactment of the new National Water and Sanitation Policy in October 2023, responsibility for managing water supply systems was transferred from the districts to WASAC. In line with this change, WASAC was also included as a contracting party in the contracts with POs. Although WASAC had previously supported districts in managing contracts, it has little experience directly entering into and administering contracts with POs. Internal systems for contract oversight remain underdeveloped, and mechanisms for supervising water quality management are unclear. As a result, the reporting and feedback loops between POs and WASAC are not functioning effectively.

(2) Weak Water Quality Management and Oversight Systems

A survey conducted in July 2023 across five districts in Eastern Province revealed that only 47% of the 107 piped water supply systems that were surveyed had chlorination equipment. Of these, 84% were functional, but only 76% were actually performing chlorination. In addition to equipment not being installed at many facilities, the reasons for this include missing or broken equipment, chlorine shortages, and a lack of technical capacity among PO staff. Furthermore, most POs have not implemented the 14 key monitoring parameters prescribed in Rwanda's Water Quality Management Framework (WQMF). This is due to a range of institutional and operational challenges, including a lack of testing equipment, limited technical capacity, and the absence of regular supervision and guidance systems.

Challenge 2: Facility Inventory Data and Pipeline Maps Are Not Used For Facility Renewals or Expansion

(1) Outdated GIS Databases and Poor Information-sharing Systems

In RWASOM1, GIS database on rural water supply facilities −covering facility and equipment specifications and location data—was compiled for all 27 districts nationwide. Asset inventories (O&M manuals) were also developed for each water supply system in four districts in Eastern Province. However, since RWASOM1 ended, the database has not been updated. WASAC District Support Engineers, who are responsible for providing technical assistance at district level, have struggled to secure sufficient time and transportation for field visits. In addition, the heavy workload involved in manually preparing asset inventories through paper-based surveys has hindered continuous updating efforts. As a result, newly constructed facilities are not reflected in the database, making it difficult to use the information effectively in planning facility renewal and expansion.

In addition, in the seven districts of Eastern Province, the operational status of water supply systems—whether functioning or experiencing breakdowns—is also not regularly monitored. Operating conditions are therefore not sufficiently recorded or shared as data, making it difficult to accurately assess performance or failures and to obtain reliable information for decisions on repairs and facility renewal.

(2) Limited Use of GIS Database in Facility Renewal and Expansion Planning

In rural areas, many public facilities—such as schools, health centers, early childhood development centers, and local government offices—remain without water supply and lack access to safe water. This contributes to the spread of waterborne diseases and serious health problems, including child malnutrition and stunting. Addressing this requires systematic expansion and upgrading of water supply systems for public facilities. However, due to limited planning capacity, there is insufficient recognition of the importance of collecting and analyzing basic data during water supply planning. Consequently, key data such as facility locations, populations served, and household connection status are often not adequately collected or updated, and planning tends to rely on past experience or simple on-site judgments. As a result, systematic and effective expansion and renewal planning using the GIS database has not sufficiently progressed.

Challenge 3: O&M System for Point Water Supply Facilities Is Not Established

(1) Lack of Community-Based Spring Protection and Safe Water Use Practices

In rural Rwanda, the use of piped water supply systems remains limited, with only 38.0% of the population relying on them (NISR, 2022). Instead, non-piped sources are more commonly used — particularly spring water, which serves as the primary source of drinking water for approximately 49.0% of rural households (NISR, 2022). Springs thus play a vital role in daily life, but because they are often located in valleys, they are highly vulnerable to contamination from rainwater runoff, muddy water, livestock waste, and soil erosion. These environmental risks pose serious health concerns, especially when water is consumed untreated. Baseline survey results confirmed that more than half of the households (63.4%) do not treat their spring water before use. Furthermore, over 80% of the springs were found to be located in surroundings with a risk of contamination. This highlights the urgent need to improve both the physical protection of water sources and hygiene awareness and behavior within communities to ensure safe water use.

(2) Unestablished O&M Framework for handpump boreholes

The baseline survey found that only 42.7% of handpump boreholes in the project area were operational, indicating that more than half were out of service. The primary reason is the lack of a functioning O&M system. One underlying challenge is that the usage rate for handpump

boreholes in rural areas is low at only 3.4% (NISR, 2022), limiting the size of the market and making it difficult to secure sufficient funding or retain qualified technicians. However, the survey confirmed 811 handpump boreholes across the seven districts in the target province. In areas where piped water systems have not yet been developed and the use of protected springs is limited, these handpump boreholes remain an indispensable and safe source of water for residents. Under these circumstances, local governments are required to operate and maintain handpump boreholes with limited budgets, human resources, and materials. In October 2023, during Phase 2, the new National Water and Sanitation Policy was issued, under which responsibility for the O&M of handpump boreholes was transferred from district governments to WASAC. At the same time, the new policy clearly prioritizes the development of piped water supply systems over handpump boreholes. As a result, WASAC has not yet established an internal structure for managing handpump boreholes, including a clearly designated unit, job descriptions, and budget allocations. Establishing an effective O&M framework for handpump boreholes under the leadership of WASAC has therefore become a key challenge.

2. Approach to Addressing Issues

2.1 Project Implementation Approach

(1) Project Overview

The Project commenced in November 2021. Known as "RWASOM Phase 2, Amazi meza, ubuzima Bwiza (The Project for Rural Water Supply Services and Infrastructure Management Development in Rwanda)", it has since gained recognition among stakeholders, development partners, and community members. The Kinyarwanda slogan, "Amazi meza, ubuzima Bwiza", means "Clean Water, Healthy Life", reflecting the Project's core mission of enabling communities to live healthier lives through access to safe water. The Project aims to strengthen the capacity to plan and implement rural water supply services, focusing on the following three main outputs as shown in Figure 1:

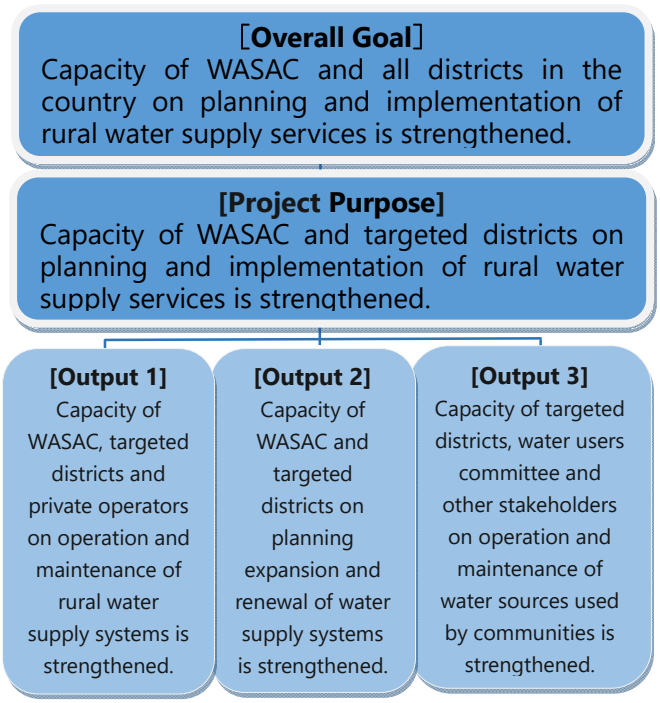


Figure 1: Framework of the Project

The cooperation period for the Project is from November 2021 to October 2026 and is divided into three phases, with the following durations:

Phase 1: November 2021 - September 2023

Phase 2: January 2024 - May 2025

Phase 3: June 2025 - October 2026

(2) Project Implementation Structure

The Project was implemented under the supervision of the Ministry of Infrastructure (MININFRA), with WASAC's RWSS department as the implementing agency. In September 2023, an organizational restructuring split WASAC into three entities: WASAC Group Ltd. as a holding company; WASAC Utility Ltd., responsible for O&M; and WASAC Development Ltd., responsible for facility construction. As part of the restructuring, urban and rural water services were merged and the RWSS department was dissolved, and staff involved in rural water supply were reassigned or retired. Following the restructuring, the Project Manager role was transferred to the Director of the Commercial Service Department, and Counterpart (C/P) personnel were appointed from both WASAC Utility Ltd. and WASAC Development Ltd.,

according to their relevance to specific Project activities.

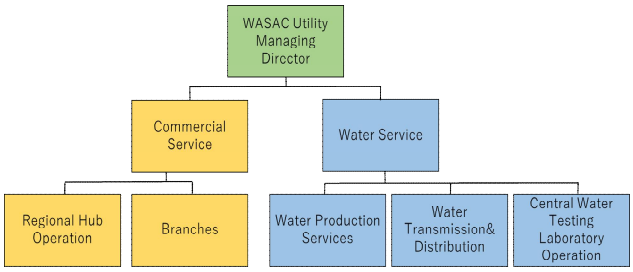


Figure 2: WASAC Utility Structure (C/P Departments Only)

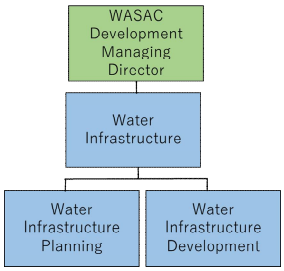


Figure 3: WASAC Development Structure (C/P Departments Only)

To facilitate smooth implementation, a Project Implementation Committee (PIC) meeting is held every quarter. These meetings serve as a platform for discussing technical and operational issues with district representatives, C/P members, and other key stakeholders. In addition, a Steering Committee (SC) meeting is held once or twice a year. This committee is chaired by the CEO of WASAC Utility Ltd. and includes representatives from relevant ministries and institutions involved in the Project. The SC is responsible for reviewing progress and evaluating achievements, while facilitating discussion about and building consensus on major decisions that affect the direction and coordination of the Project.

2.2 Approach to Addressing Issues

The following approaches address issues identified in Phases 1 and 2 of the Project.

Approach 1: Establishing an O&M Framework for Piped Water Supply Systems

(1) Supporting the Development of a New O&M Structure for Piped Water Supply Systems

Under the National Water and Sanitation Policy issued in October 2023, the responsibility for the O&M of piped water supply systems was transferred from district governments to WASAC. As part of this change, it was also stipulated that WASAC would become the contracting party responsible for entering into service agreements with POs. To that point, however, while WASAC had supported districts in contract management, it had not been directly responsible for managing PO contracts. As a result, WASAC lacks both a formal system for contract oversight and hands-on experience in directly managing contracts. In light of this, in this approach the Project therefore assists WASAC in establishing clear internal procedures for contract formulation, supervision, and overall contract management, as well as in building and strengthening the internal organizational structure needed to smoothly carry out these responsibilities.

(2) Enhancing the Water Quality Management Capacity of POs and Strengthening the Supervision System

To enable POs to carry out proper water quality management, the Project identifies and provides essential testing equipment, including residual chlorine meters, *E. coli* testing kits, and other water quality tools such as pH and conductivity meters, turbidity meters, and colorimeters. It also organizes technical training through workshops that cover both theoretical knowledge on water quality management and practical instruction on the use of this equipment. In addition, the Project develops a standardized reporting format for water quality data that will allow WASAC to collect data from POs on a regular basis, conduct analysis, and provide feedback.

Approach 2: GIS-Based Planning for the Renewal and Expansion of Piped Water Systems

(1) Enhancing GIS Database Management and Information Sharing on Facility Operations

In this approach, the Project converts the asset inventories (O&M manuals) developed for each water supply system under RWASOM1 into a GIS-based format, with a system created that allows essential O&M information — such as facility location, year of

construction, and expected service life — to be updated and shared efficiently. To support data collection, a system is introduced in which field staff use smartphones and tablets to collect facility and location data, which they upload on-site directly to the GIS database. The Project also provides practical training to ensure the smooth operation of this new system by staff; further, a system is established so that staff can accurately and efficiently manage and update the GIS database.

In seven districts of Eastern Province, the Project introduces a weekly email reporting system that shares the operational status of piped water supply systems with relevant stakeholders. This approach helps ensure timely responses to system failures, contributes to reducing service interruptions, and builds a data set that informs decisions on facility repair and renewal. The collected data are organized as baseline information to clarify the actual operating status and repair needs of each facility. The data also serve to improve the accuracy and effectiveness of facility renewal planning.

(2) Utilizing GIS Databases for Planning the Renewal and Expansion of Water Supply Facilities

To support the development of expansion plans for rural water supply systems in rural public facilities, mapping surveys are first conducted at public institutions such as schools, health centers, and early childhood development centers. These surveys collect basic data including location, the status of household connections, and the population being served, which are then used to build a GIS database for public facilities.

In phase 2, additional training is provided to new C/P staff assigned following the institutional reorganization. Workshops are also held across the seven districts of Eastern Province to promote the practical use of GIS database in water supply expansion plans and further strengthen planning capacity.

In addition, asset assessments are also carried out for piped water supply systems under PO contracts to evaluate the urgency of renewals or expansions. Based on the results, three-year facility renewal plans are developed and budgeted with clear prioritization and support is provided to establish the systems required to ensure these plans can be implemented effectively.

Approach 3: Establishing an O&M System for Point Water Supply Facilities

(1) Protecting Spring Water Sources and Promoting Safe Water Use

In this approach, Community Mobilization Teams (CMTs) are established in seven districts of Eastern Province to promote the protection of spring water sources in collaboration with local communities. Baseline surveys are first conducted in pilot sectors to examine current conditions around the springs and identify key risks. Based on the findings, Community Water Safety Plans (CWSPs) are introduced in partnership with CMTs. CWSPs are action plans developed by residents themselves that identify contamination risks at every stage of water use—from source protection and water collection to transport and use in the household—and set out concrete measures to address these risks so that safe water can be used. Once a CWSP has been formulated, CMTs and residents jointly monitor CWSP implementation and make improvements as needed. Further, at pilot sites identified as needing protection, physical improvements are also made to safeguard spring sources. These include the construction of intake facilities and measures to improve water quality.

(2) Redefining the O&M System for Handpump Boreholes

During the first phase of the Project, CMTs established in each district played a central role in discussions around establishing a community- and district-led system for the O&M of handpump boreholes. However, the National Water and Sanitation Policy issued in October 2023 transferred responsibility for the O&M of handpump boreholes from district governments to WASAC. As a result, the previously proposed district-led model no longer aligned with the new policy direction, making it necessary to redefine the O&M framework. In response

to this shift, efforts to establish a district-led O&M system have been discontinued. The Project now focuses on designing a WASAC-led framework by revisiting the relevant outputs and activities of the Project to ensure consistency with the updated institutional structure.

3. Results of the Approaches

Result 1: Supervision System Established and Water Quality Training Conducted for Rural Water O&M

(1) Establishing a Supervision System for POs by WASAC and Districts

In Phase 2, responsibility for water quality management was transferred to WASAC's Water Quality Laboratory as part of the organizational restructuring. In response to this change, consultations were held with the head of the laboratory, and a new supervisory structure was developed to enable appropriate oversight of POs in each district. Under the new system, each district's WASAC branch collaborates with a nearby Water Treatment Plant (WTP) to jointly supervise and support the work of POs (see Figure 4). This arrangement was agreed upon by the laboratory head, the managers of the WTPs, and WASAC branch managers in all seven districts of Eastern Province. As part of the supervision system, a procedure has been established whereby POs submit their water quality data to both the WASAC branch responsible and the associated WTP. The WTP then reviews the data submitted and provides feedback as necessary to the PO.

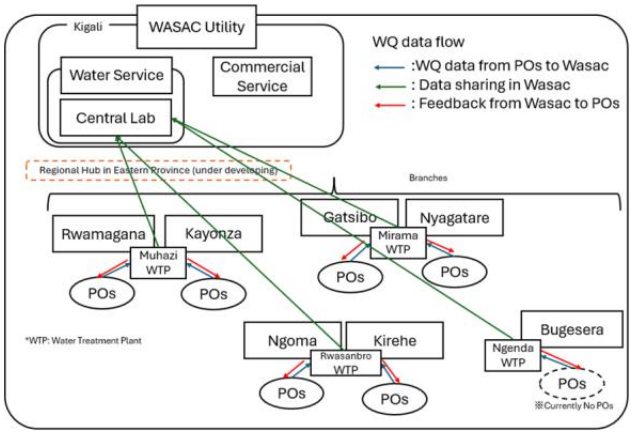


Figure 4: Water Quality Data Management Structure for POs under WASAC

(2) Strengthening Water Quality Management Capacity and Oversight for POs

To enhance the water quality management capacity of POs, essential testing equipment was selected in collaboration with C/P staff and procured by March 2025. Utilizing the new equipment introduced, training sessions were conducted for PO staff in each district, staff from the supervising WTPs, and Water and Sanitation officers from the districts. In addition to core knowledge, the training covered both theoretical and practical aspects of water quality management, with participants learning about changes in methods of supervision under the new policy framework, techniques for measuring and adjusting residual chlorine levels, and proper usage of water quality testing tools such as pH and conductivity meters, turbidity meters, and colorimeters.

Separate training was also provided to WASAC laboratory staff, focusing on the 14 key water quality monitoring parameters defined in the national Water Quality Management Framework. An additional session on the analysis of organic matter was included. Participants showed improvement in both testing accuracy and conceptual understanding.

In addition, to promote practical solutions, a public-private technology demonstration was held at WASAC headquarters. Four companies presented solutions aimed at improving rural water services: EBARA Pumps East Africa (a branch of the Japanese company EBARA Corporation, providing pump and solar irrigation facility leasing); ECOMEM Co. Ltd. (a local company distributing SATO toilets and taps—products by Japanese company LIXIL designed for developing countries); SPOUTS of Water Rwanda (a local social enterprise supplying ceramic purifiers); and Sunda Technology Global (a startup founded by a former Japan Overseas Cooperation Volunteer, offering prepaid borehole fee collection systems). The event served as an opportunity to explore potential applications of new technologies.

Result 2: GIS Database for Piped Water System Renewal and Expansion Collected, and Guidance Provided on Its Use

(1) Collecting Water Supply Facility Data for GIS Database Updates and Developing an Information Sharing System

In five districts of Eastern Province where water supply systems are managed by POs, data required for the creation of asset inventories (O&M manual) and GIS databases were collected. A system has been established to manage and update this data within a GIS platform. The items collected are shown in Table 1 below.

Table 1: Data Items for GIS Database Development

Items Collected
Location (X, Y), Theoretical technical lifespan (year), Functional lifespan (year), Book value, Costs expected (RWF), Priority, Years until action needed, Year of Construction, Year of replacement

To support facility data collection, mapping training was conducted for PO engineers and Water and Sanitation officers using open-source GIS software (QGIS) and a mobile app (QField). A digital system was introduced allowing staff to copy and paste survey data directly into smartphones or tablets and reflect data acquired in the field in the GIS database. This approach has reduced the need for handwritten survey forms and manual data entry while also minimizing transcription errors, thus improving efficiency and data accuracy (see Figure 5).

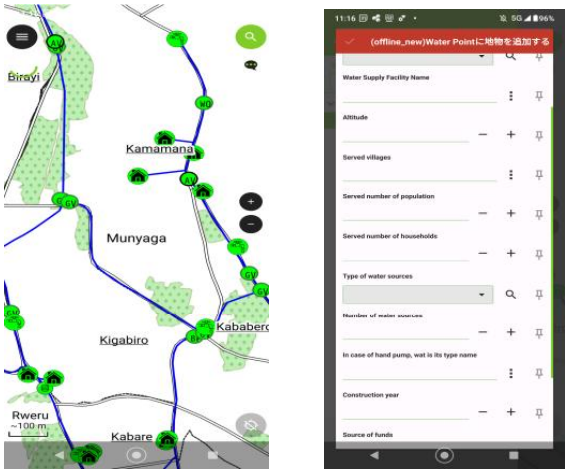


Figure 5: Data Entry Screen for Facility Survey Form

In addition, a weekly e-mail reporting system was launched across all seven districts of Eastern Province to share the operational status of rural water supply systems with key stakeholders. As part of the ongoing assessment of these systems, facility operation and information about major malfunctions are regularly collected and reviewed. This enables the timely identification of facilities that require urgent attention, based on critical information about such things as pump failures or system outages. Regular information sharing has also contributed to more active communication among stakeholders and an enhanced understanding of actual system conditions. The Project continues to promote this approach to build awareness and strengthen rapid response among those involved in rural water service delivery (See Figure 6).

Kayonza District

Persons in charge:

No	WSS ID	Name of WSS	Name of PO	Status of WSS	Type of WSS	Cause of Partially Functioning and Not Functioning	Since When becomes Partially Functioning and Not Functioning	Countermeasure
1	5045	GATARE	PAAK KAM Ltd	Fully Functional	Electrical Pumping System			
2	5043	KARONGI	PAAK KAM Ltd	Partial Functional	Electrical Pumping System			Works of reinforcement by new springs, pumping station and pipeline rehabilitation ongoing
3	5041	KABONOBONO	PAAK KAM Ltd	Partial Functional	Electrical Pumping System	-Reduction of water discharge from the source - Old pipeline	2018	The works of upgrading and rehabilitation already started few weeks ago with the support of WASAC in partnership with RBC.

Figure 6: Example of a Weekly Monitoring Report on Water Supply System Operations

(2) Training on Planning for the Renewal and Expansion of Water Supply Facilities

In Phase 2, in line with the reorganization of the C/P structure, additional training sessions were conducted for WASAC branch engineers, POs, and Water and Sanitation officers in seven districts of Eastern Province. These sessions aimed to enhance their capacity in developing water supply expansion plans. In addition, workshops were held in each district to support the development of concrete expansion plans. Topics included pipeline modeling using GIS database, hydraulic calculations, and preliminary cost estimation. Further, to support the effective implementation of future activities, a Training of Trainers (ToT) program was conducted in Rwamagana District using the development of

pipe network models for local water supply facilities as a practical exercise (Photo 1). As part of this process, network models were created for all nine facilities in the district.

Photo 1: Example of a Pipe Network Model and Hydraulic Calculation (Rwamagana District)

Additionally, asset assessments were also carried out for facilities managed by POs and lists of facility renewal items developed for each facility. Based on these lists, estimated costs for rehabilitation and expansion were calculated and priorities were clarified, with district-level renewal lists organized. These efforts formed the basis for the development of three-year facility renewal plans.

Result 3: Safe Water Use Promoted and Community Awareness Strengthened at Point Water Facilities

(1) Establishing Community-Led Structures for Safe Water Use and Protection of Spring Water Sources

In Phase 1, cross-sector CMTs were established in consultation with district authorities. While composition varies by district, teams generally include representatives from multiple sectors, as shown in Table 2.

Table 2: General Composition of CMTs

District Level	Director of Infrastructure One Stop Center, Water and Sanitation Officers, Director of Health, Director of Education, and Director of Good Governance
Sector Level	Sector Executive Secretary, Land Settlement and Infrastructure Management Officer, Health and Hygiene Officer, Social Economic Development Officer, Sector Education Inspector, Good Governance Officer, Business Development, Investment & Employment Officer, Heads of the Community Health Workers and Community Environmental Health Officer

In Phase 2, practical field guidelines for implementing CWSPs were developed in English and Kinyarwanda. Participatory workshops for CWSP development were held in districts where model construction for the protection of spring water sources had started (see Table 3). To date, these workshops have been completed at 15 sites across five districts. Moreover, to promote the effective use of the guidelines, a Training of Facilitators (TOF) program was launched for CMTs. This training aims to build the capacity of CMTs to independently conduct CWSP workshops and support sustained implementation at the community level.

WASAC Group — Umushinga witwa RWASOM 2, Amazi meza Ubuzima bwiza — JICA
(THE PROJECT FOR RURAL WATER SUPPLY SERVICES AND INFRASTRUCTURE MANAGEMENT DEVELOPMENT IN RWANDA)

Community Water Safety Plan

Date: 12th, March 2025 / Name of the Spring: Rubirizi

Potential hazards	Improvement to be taken	Who	When	Resource (Who)
1. Households upstream of the spring, lacking a method to collect rainwater from gutters, cause erosion	・Awareness campaign for the community on collecting rain water from roofs ・Penality for those who do not comply ・Digging ditches for rain water management	・CWSP Team ・House owners ・Nsanzumuhire Abdoulkalimu	・Starting from 12th, March 2025 in inteko community meeting / In inteko community meeting every Wednesday ・Starting from 19/3/2025 to 30/3/2025 (Digging ditches)	・Community ・Hoe, Shovel, Fork
2. Open defecation near the spring	・Awareness campaign for the community on preventing defecation near the spring ・Penality for those who do not comply	・CWSP Team ・Munyakayanza Marc	12th, March 2025 in inteko community meeting / In inteko community meeting every Wednesday	Community
3. Bringing livestock to the spring area	・Awareness campaign for the community on preventing bringing livestock to the spring ・Penality for those who do not comply	・CWSP Team ・Hakizimana Emmanuel	12th, March 2025 in inteko community meeting / In inteko community meeting every Wednesday	・Owners of livestock

Prepared by:

Table 3: Examconple of a CWSP Action Plan (Kirehe District)

Furthermore, model construction for the protection of spring water sources has been carried out at selected pilot sites, with work completed to date at 15 out of the 20 planned locations. As part of protection measures, fencing has been installed around the springs to prevent intrusion by people and livestock, and drainage channels have been built to stop rainwater runoff from entering the water sources. Following completion of construction, O&M training is provided to local residents to support community-led efforts in sustainable preservation of water sources over the long term. Further, to assess the impact of the protection work, water quality tests were conducted after construction and compared with baseline data collected in 2022. After construction, many spring sites showed significant reductions or non-detection of total coliforms and *E. coli*, leading to improved drinking water safety. Additionally, decreases in fluoride concentrations and variations in spring discharge volumes

were observed. Temporary increases in turbidity at some sites were also noted, likely due to rainfall prior to testing. Looking ahead, water quality monitoring will continue twice a year—during the dry and rainy seasons—throughout the Project period, to track the effectiveness of the protection measures (see Photos 2 and 3).

Photo 2: Before Construction for the Protection of Spring Water

Photo 3: After Construction for the Protection of Spring Water

In Rwanda, many households collect and transport spring water using containers known as jerrycans. However, maintaining sanitary conditions inside these containers remains a challenge. According to the baseline survey, 99.8% of households use jerrycans, but only 48.1% reported cleaning them frequently before collecting water. To better understand this issue and identify effective cleaning practices, a study was conducted to evaluate the internal cleanliness of jerrycans from visual, microbiological, and chemical perspectives. Photo 4 shows the external appearance and internal condition of the contaminated jerrycans collected for the jerrycan cleaning study.

Photo 4: Appearance and Interior of Used Jerrycans Collected for the Study

The objectives of the study were: (1) to examine the relationship between the level of contamination inside the jerrycans and the presence of microbial indicators such as *E. coli* and total coliforms; and (2) to test the effectiveness of different cleaning methods in reducing microbial contamination. The study found no clear relationship between internal contamination in jerrycans—whether visible dirt or substances such as organic matter that are not visible—and microbial contamination. It was assumed that if a correlation could be identified between visible dirt and microbial presence, it would allow for clear hygiene messaging such as, “If your jerrycan looks this clean, it’s safe to use.” However, the study did not produce such findings. On the other hand, the results confirmed that cleaning jerrycans itself can effectively reduce E. coli and total coliform levels. No clear differences in effectiveness were observed between the various cleaning agents and materials used. These findings can therefore be applied to future hygiene promotion activities targeting community residents.

(2) Redefining the O&M System for Handpump Boreholes

In Phase 2, activities were carried out in response to the shift in responsibility for handpump borehole maintenance to WASAC, following the enactment of the new National Water and Sanitation Policy in October 2023. However, as of now, WASAC has not yet established a dedicated unit, defined roles, or a clear

strategic direction for managing handpump boreholes. At the same time, in seven districts of Eastern Province, various development partners —including donor agencies, local and international NGOs, and social enterprises that utilize carbon credits—have been actively engaged in efforts to improve borehole O&M. In particular, in several districts, a significant number of boreholes are already supported by these partners. Collaboration with them is therefore essential as WASAC begins to take the lead in building its own O&M system. Given this situation, the Project has begun reviewing the activities and future plans of development partners operating in the seven districts. Discussions have been initiated to explore practical areas of collaboration between WASAC and these partners and, based on these efforts, the Project is preparing recommendations for the establishment of an effective framework for cooperation. This approach has been agreed upon with WASAC, and coordination with NGOs active in the target areas is already underway.

4. Lessons Learned in the Project

(1) Weekly Reports on the Operation Status of Piped Water Supply Systems

To better track and share the operational status of piped water systems in seven districts of Eastern Province, a new system was introduced in which weekly reports are prepared based on information gathered from POs, Water and Sanitation officers, and WASAC branch staff and shared among concerned parties. The reports target facilities managed by POs, by WASAC directly, and by donor agencies and communities, with the operational status of each facility placed in one of three categories: fully operational, partially operational, or non-operational. Moreover, urgent issues such as pump failures are flagged and immediately shared via email, enabling prompt repairs and response. This approach has made detailed, real-time information available to all stakeholders, facilitating rapid response and problem solving by teams on the ground. The weekly system offers more timely and comprehensive updates than the previous monthly PO reports and has been well received by stakeholders.

(2) Establishing an Efficient System for Managing and Updating Water Supply Facility Information

In RWASOM1, asset inventories (O&M manuals) for water supply facilities were prepared for four districts in Eastern Province. However, after the project was completed they were not regularly updated, and their use remained limited. This was mainly because preparing paper-based inventories through interviews required substantial effort, particularly given that each district had only one WASAC District Support Engineer managing a large number of water supply systems. Difficulties in securing transport and time for regular field visits further hindered continuous updating. Building on these lessons, RWASOM2 is introducing a simplified system that allows on-site facility managers (POs) to update facility information as part of their routine work. Smartphones and tablets with GIS software enable immediate entry and updating of key data such as facility locations, specifications, and construction years. Moreover, by integrating the GIS database with the asset inventories (O&M manuals), the system automatically generates reports with asset information such as book value and remaining lifespan, eliminating manual calculations and data transcription. This new system improves accuracy and efficiency and ensures that WASAC and district stakeholders have access to updated facility information for planning facility renewal, water supply expansion, and other decisions.

(3) Strengthening Community-Led Hygiene Awareness Activities

In community awareness activities, the heads of Community Health Workers (CHWs) and the Community Environmental Health Officer (CEHO) based at health centers have been engaged as facilitators. Because they are well acquainted with local conditions and challenges related to hygiene, they play a key role in helping communities develop realistic and effective action plans.

They also provide technical input on risk factors, helping organize ideas and facilitate productive dialogue. Further, in Phase 2, these local frontline personnel were officially included in CMTs and participated in training sessions, further strengthening the overall implementation structure for awareness-raising activities. In addition, the Project has also made use of *Inteko* — traditional community meetings rooted in Rwandan society — where village leaders and residents gather voluntarily to discuss local issues and solutions. These gatherings occur without any need for external facilitation or project-led coordination. By using *Inteko* as a platform for selecting community members for the O&M of springs and for sharing updates on ongoing activities, the Project helped ensure that awareness-raising activities had a sense of local ownership rather than feeling externally donor-driven, which encouraged stronger community participation and ownership (see Photo 5).

Photo 5: Community Gathering at an *Inteko* Meeting

(4) Strengthened Collaboration with "Water Security Action Team" of Japan Overseas Cooperation Volunteers

Since the Fourth Tokyo International Conference on African Development (TICAD IV) held in 2008, JICA has dispatched numerous Japan Overseas Cooperation Volunteers (JOCVs) specializing in water and sanitation—known as the "Water Security Action Team (W-SAT)"—to Africa, including Rwanda. To reinforce collaboration with these W-SAT members, the Project is working closely with the Volunteer Coordinator at the JICA Rwanda Office to align areas of activity as much as possible. As a result, volunteers and the Project team have been able to operate at activity sites in close proximity with each other, making coordination smoother and more effective. Also, an information-sharing mechanism now provides W-SAT members with direct access to Project deliverables and activity schedules, reducing administrative overhead. In addition to inviting volunteers to participate in trainings and workshops, the Project engages them from the very start of community interventions — such as asking them to collaborate in joint discussions with district officials — to accelerate their understanding of Project objectives. Furthermore, coordination meetings help strengthen the partnership by providing W-SAT members with a forum to present their activities and develop collaboration plans with Japanese technical experts (see Photo 6).

Photo 6: W-SAT of JOCV Participating in a Group Exercise for CWSP Training

[Project Implementation Period: 1/11/2021- 30/10/2026]

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