Republic of Uganda

FY 2022 Ex-Post Evaluation Report of

Japanese Grant Aid Project

"The Project for Rural Water Supply in Lake Kyoga Basin, Eastern Uganda"

External Evaluator: Tomoko Tamura, Kaihatsu Management Consulting, Inc.

## 0. Summary

This project was implemented to improve water supply conditions in nine Rural Growth Centers (RGCs)[1] in the five districts of the Lake Kyoga Basin in Republic of Uganda by constructing piped water supply facilities, thereby contributing to the improvement of living environment.

At both the planning and ex-post evaluation of the project, the provision of safe water and improvement of water supply conditions were priorities for Uganda. The objectives of the project were consistent with the country's development policy and sectoral strategy. The RGCs selected for the project had a relatively low coverage ratio of water supply, high population density, and a significant need for piped water supply facilities. At the time of the ex-post evaluation, the project facilities were still considered important for water supply services in the project area. The project was consistent with Japan's ODA policy at the time of planning. Interconnection with another JICA project was planned and implemented and contributed to the efficient implementation of this project. Synergies and interconnections with other donors' projects were neither planned nor realized. Therefore, the appropriateness and consistency of the project are high.

Through this project, piped water supply facilities for intake, distribution, and water supply, and pipelines were constructed in nine RGCs as planned. The technical guidance (soft component) for building consensus among residents on the use of water supply facilities and for operation and maintenance was also implemented as planned. The project cost and period were within the plan. The efficiency of the project is therefore very high.

The actual volume of water supplies by the project was much lower than the target, and the effects of the project were created only to a certain extent compared to the plan. However, this was due to a delay in the Ministry of Water and Environment providing support to re-establish the operation and maintenance structure of the facilities, because of the Covid-19 pandemic. The turbidity, which was set as an indicator to measure the effect of the project on water quality improvement, is below the standard values in all RGCs, and achieved the target. Although a reduction in waterborne diseases could not be confirmed due to lack of data, the expected impact has been created such as reducing the burden of fetching water and an improvement in living

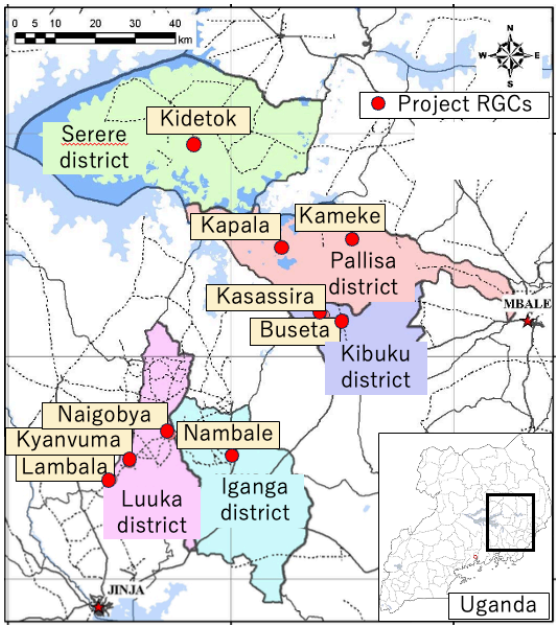
[1] RGC stands for a Rural Growth Center. This refers to is a densely populated and commercial areas, with a population of 500 to 5,000, which has spontaneously formed at the junctions of major roads in rural areas of the country. It is not an administrative division.
The nine RGCs in the five districts are Nambale (Iganga district), Lambala, Kyanvuma, Naigobya (Luuka district), Kasassira, Buseta (Kibuku district), Kameke, Kapala (Pallisa district), and Kidetok (Serere district).

conditions. From this, the effectiveness and impact are moderately low.

There are no problems with the operation and maintenance of the project facilities in terms of related policies and systems. On completion of the project, responsibility for operation and maintenance rested with the Water Supply and Sanitation Board (WSSB)[2], but this was transferred to the Eastern Umbrella Water and Sanitation Organization (E-UWS)[3] in September 2022. There is no problem with E-UWS in terms of organizational, institutional, technical, and financial aspects, and sustainability is ensured. In addition, precautionary measures are being taken regarding environmental and social considerations and risks. The sustainability of the effects of the project is very high.

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

## 1. Project Description




Project Location

Elevated Water Tank (Kameke)

Solar Power Generation Facility (Buseta)

Map: prepared by the evaluator, based on materials provided by JICA; photo taken by the external evaluator.

[2] The WSSB includes representatives of the sub-counties (local governments of villages) and residents.

[3] UWS is a water utility under the Ministry of Water and Environment, responsible for operation and maintenance of piped water supply facilities. UWS aims to support and complement WSSBs whose operation and maintenance capacity had reduced, or which were overburdened. The Ministry recognized that many WSSBs were facing challenges with the operation and maintenance of piped water supply facilities, and, in particular, there needed to be an organization to help with matters that were difficult for them, such as procurement of spare parts, major repairs, accounting audits, training and water quality testing. The Ministry strengthened the Umbrella Organizations, the predecessors of UWS, and upgraded their status to water utilities. Currently, five UWSs have been established in the Eastern, Mid-Western, Northern, Central and South-Western regions. The facilities of the project are under the jurisdiction of the Eastern UWS (E-UWS). The evaluator investigated whether the E-UWS could have taken over the operation and maintenance of the facilities of the project from the beginning and found this was not possible as the Umbrella Organizations were not a water utility but a supporting organization at the time of completion of the project. In other words, the WSSBs were the only organization that could undertake the operation and maintenance of the facility of the project at that time.

## 1.1 Background

At the time of planning this project, the water supply coverage rate in rural areas of Uganda was 65%; this was low, compared to 73% in urban areas.[4] The average water supply coverage rate in the 38 districts in Lake Kyoga Basin - the largest water basin in the country covering approximately 25% of the land area of the country - was 57%, which was lower than the average for rural areas in Uganda (65%), and there was a significant need for improvement. The Development Study on Water Resources Development and Management for Lake Kyoga Basin in the Republic of Uganda, conducted by JICA from 2009 to 2011, found that the RGCs in these districts had a high population density and were extensively using wells with hand pumps as the main source of water. As a result, the residents had a difficult task fetching water, as they had to wait for a long time. It was also found that there was a significant need to develop piped water supply facilities with safe groundwater, as there was concern about contamination of the water source for some of the existing wells with hand pumps.

To improve this situation, the Government of Uganda requested grant assistance from the Government of Japan, mainly for construction of piped water supply facilities in RGCs in the districts.

## 1.2 Project Outline

The objective of this project is to improve the water supply conditions at the nine RGCs in the five districts in the Lake Kyoga Basin by constructing piped water supply facilities, thereby improving the living environment.[5]

| | |
|---|---|
| Grant Limit / Actual Grant Amount | 1,706 million yen / 1,676 million yen |
| Exchange of Notes Date / Grant Agreement Date | May 2017 / May 2017 |
| Executing Agency | Ministry of Water and Environment |
| Project Completion | June 2019 |
| Target Area | 9 RGCs in 5 districts in the Lake Kyoga Basin |
| Main Contractor | Konoike Construction Co., Ltd. |
| Main Consultant | Joint venture of OYO International Co. Ltd. and TEC International, Co., Ltd. |
| Preparatory Survey | May 2015 - March 2017 |
| Related Projects | Development Study on Water Resources Development and Management for Lake Kyoga Basin in the Republic of Uganda (March 2009 - March 2011, JICA) |

[4] *Water and Environment Sector Performance Report 2015*, Ministry of Water and Environment, Government of Uganda, 2015 (Page ix and page 32). The report defines water supply coverage rate as the percentage of the population with access to safe water sources within 1,000 m in rural areas and within 200 m in urban areas.

[5] The ex-ante evaluation paper of the project stated as follows: "To increase water supply volume at the nine RGCs in the five districts in the Lake Kyoga Basin by constructing piped water supply facilities, thereby improving the living environment through improvement of water supply conditions." In this evaluation, this description was amended in accordance with the standard notation of JICA's project outline, and the purpose of the project was modified from "to increase water supply volume" to "to improve the water supply conditions" in line with the project content.

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Tomoko Tamura, Kaihatsu Management Consulting, Inc.

### 2.2 Duration of Evaluation Study

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

Duration of the Study: December 2022 - March 2024

Duration of the Field Study: May 28, 2023 - June 13, 2023

September 13, 2023 - September 29, 2023

## 3. Results of the Evaluation (Overall Rating: B[6])

### 3.1 Relevance / Coherence (Rating: ③)[7]

#### 3.1.1 Relevance (Rating: ③)

##### 3.1.1.1 Consistency with the Development Plan of Uganda

Both the *Second National Development Plan (2015/16-2019/20)*,[8] Uganda's development plan at the time of planning this project, and the *Third National Development Plan (2020/21-2024/25)*, Uganda's development plan at the time of the ex-post evaluation, place water and sanitation as a priority sector, with the strategic goal of increasing the water supply coverage rate. The *Water and Environment Sector Development Plan (2015/16-2019/20)*, the country's water sector development plan at the time of project planning, identified the construction of water supply facilities in underserved areas and the introduction of appropriate technologies into RGCs, such as piped water supply systems and solar power generation facilities, as key measures. At the time of the ex-post evaluation, the *Third National Development Plan* was considered the country's water sector plan, which aims to increase the water supply coverage rate and improve the water supply situation. The objectives of the project are consistent with the development plan and plans of the country both at the time of planning and at the time of ex-post evaluation.

##### 3.1.1.2 Consistency with the Development Needs of Uganda

As mentioned in "1.1 Background," at the time of project planning the water supply coverage rate in rural areas of Uganda was lower than that in urban areas. In RGCs, which are densely populated and commercial areas in the rural areas, fetching water was a major burden on residents, and there was concern about contamination of water sources from wells with hand pumps. Thus, there was a significant need for piped water supply facilities with a safe groundwater source in

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

[7] ④: Very High, ③: High, ②: Moderately Low, ①: Low.

[8] Uganda's governmental fiscal year runs from July to June of the following year.

the target area. At the time of the ex-post evaluation, the water supply coverage rate in rural areas of the country was still 67%, lower than 72% in urban areas,[9] and the need for improvement remains high. The water supply facilities developed by the project are essential for the livelihood of the residents and are of great importance. The objective of the project is consistent with development needs at both the time of planning and ex-post evaluation.

#### 3.1.1.3 Appropriateness of the Project Plan and Approach

As discussed later in the section on “effectiveness” in this report, the water supply volume, an operation indicator for the project, was lower than the target. This was mainly due to a delay in the Ministry of Water and Environment re-establishing the operation and maintenance structure of the project's water supply facilities because of the Covid-19 pandemic. Using lessons learned from previous similar projects, social surveys, and technical guidance aimed at effective operation of the water supply facilities were planned and implemented during construction of the facilities, and before and after handing over the facilities. The plan and approach for the project were appropriate.

### 3.1.2 Coherence (Rating: ③)

#### 3.1.2.1 Consistency with Japan's ODA Policy

Rural water supply was a priority cooperation area in the Japanese Ministry of Foreign Affairs' *Country Assistance Policy for the Republic of Uganda (June 2012)* and *JICA Country Analytical Paper (March 2015)* at the time of planning. The project is also consistent with the support measure "Access to safe water and improved sanitation for 10 million people" expressed by the Japanese government at the 5th African Development Conference in 2013. Thus, the objectives of the project are consistent with ODA policy of Japan at the time of planning.

#### 3.1.2.2 Internal Coherence

A JICA expert in water supply facility maintenance was dispatched to Uganda from August 2018 to August 2019. He was expected to provide technical and administrative support for implementation of the project, and to confirm progress and provide advice on establishment of the operation and maintenance system of the project facilities, as a part of his activities. He participated in the progress meetings of the project and visited the construction sites to understand the current situation and issues. He used the knowledge gained from these activities to promote understanding of the project to the Ministry of Water and Environment, and to facilitate and coordinate communication between the parties concerned. As discussed in section ‘3.2 Efficiency,’

[9] Information from 2021 - 2022, provided by the Ministry of Water and Environment.

the project was completed within the planned period, and his efforts contributed to this. Regarding the establishment of the operation and maintenance system, he monitored the progress, observed the operation and maintenance in Nambale during the test operation of the project facilities, and advised the WSSB on monitoring the difference between water distribution and consumption, and improving the accuracy of bookkeeping entries. In this way the collaboration between the said JICA expert and the project was implemented as planned, and effective in the efficient implementation of the project.

#### 3.1.2.3 External Coherence

At the time of planning, complementarity, synergetic effects, coordination with projects undertaken by other Japanese institutions, other donors, and international frameworks were not planned, and were not realized.

The project was highly consistent with Uganda's development plan and development needs, and there were no problems with the project plan or approach. The project was consistent with Japan's ODA policy. Interconnection with another JICA project was planned and implemented and contributed to the efficient implementation of this project. Synergies and complementarity with other donors' projects were neither planned nor realized. Therefore, its relevance and coherence are high.

## 3.2 Efficiency (Rating: ④)

### 3.2.1 Project Outputs

[Facility Construction]

Piped water supply facilities consisting of intake, distribution, water supply facilities, and pipelines were constructed at 9 RGCs as planned (Tables 1 and 2).

**Table 1: Planned and Actual Construction of the Major Facility in the Project**
**- Water Intake and Distribution Facilities**

| RGC | Intake facility (Nos.) | | | | | | Distribution faciity Elevated tank (Nos.) | | Difference |
|---|---|---|---|---|---|---|---|---|---|
| | Source borehole | | Solar power generation facility | | Generator | | | | |
| | Planned | Actual | Planned | Actual | Planned | Actual | Planned | Actual | |
| Nambale | 2 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | As planned |
| Lambala | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | As planned |
| Naigobya | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | As planned |
| Kyanvuma | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | As planned |
| Kasassira | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | As planned |
| Kameke | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | As planned |
| Kapala | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | As planned |
| Buseta | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | As planned |
| Kidetok | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | As planned |
| Total | 12 | 12 | 4 | 4 | 1 | 1 | 9 | 9 | As planned |

Source: Sources for the plan is the preparatory survey report. Sources for actuals are materials provided by JICA and the implementing agencies, and field surveys.

**Table 2: Planned and Actual Construction of the Major Facility in the Project**
**- Water Supply Facilities and Pipelines**

| RGC | Water supply facility (Nos.) | | | | Pipeline extention (km) | | | | Difference |
|---|---|---|---|---|---|---|---|---|---|
| | Kiosk | | Yard tap for institution | | Transmission pipe | | Distribution pipe | | |
| | Planned | Actual | Planned | Actual | Planned | Actual | Planned | Actual | |
| Nambale | 6 | 6 | 12 | 12 | 1.28 | 1.28 | 4.27 | 4.27 | As planned |
| Lambala | 5 | 5 | 8 | 8 | 0.48 | 0.48 | 2.34 | 2.34 | As planned |
| Naigobya | 7 | 7 | 9 | 9 | 1.04 | 1.04 | 5.37 | 5.37 | As planned |
| Kyanvuma | 9 | 9 | 12 | 12 | 4.87 | 4.87 | 5.39 | 5.39 | As planned |
| Kasassira | 11 | 11 | 11 | 12 | 1.27 | 1.27 | 6.51 | 6.51 | Yard tap: +1 |
| Kameke | 7 | 7 | 11 | 11 | 1.92 | 1.92 | 3.64 | 3.64 | As planned |
| Kapala | 7 | 7 | 12 | 12 | 3.00 | 3.00 | 3.52 | 3.52 | As planned |
| Buseta | 9 | 9 | 11 | 11 | 0.86 | 0.86 | 5.58 | 5.63 | Distribution pipe: +50m |
| Kidetok | 9 | 9 | 13 | 13 | 2.80 | 2.80 | 6.29 | 6.12 | Distribution pile: -170m |
| Total | 70 | 70 | 99 | 100 | 17.52 | 17.52 | 42.91 | 42.79 | Yard tap: +1<br>Distribution pipe: -120m |

Sources: Source for the plan is the preparatory survey report. Sources for actuals are materials provided by JICA and the implementing agencies, and field surveys.

Notes:

(1) Kiosk is a facility set up to sell water to households. It is a concrete hut with three public taps inside. Kiosk attendants, selected from the residents, sell water.

(2) Although the project's ex-ante evaluation paper lists 88 public water taps (presumably referring to kiosks), it was confirmed that there were 70, based on the preparatory survey report and materials provided by JICA.

(3) Yard taps for institutions are taps installed on the premises of hospitals, schools, and others.

The output of the project was as planned apart from one additional yard tap for institutions, and a reduction of 120 m in distribution pipeline extension. The increase in the number of yard taps was in response to requests from residents. The reduction in the extension of distribution pipelines was a result of reviewing the route for laying the lines to avoid houses and roads. In addition, minor design changes were made to the capacity of the submersible motor pump, the construction method for the foundation of the elevated water tanks and distribution lines, and the material for the pipelines. These were in response to the results of the site survey and geological investigations during detailed design and needs that arose during construction. These changes did not affect the facility operation or effectiveness of the project.

Elevated Water Tank (Kapala)

Water Intake Facility (Kasassira)

Kiosk (Kameke)

Yard tap for Institution (a school in Kidetok)

Photos: Taken by external evaluator

[Consulting Services] Consulting services, such as detailed design and construction management, were implemented as planned.

[Technical Guidance Component] The technical guidance component was conducted twice as planned, the first round during construction and the second round over the period before and after the project was completed. The first round of the component included a survey of residents' awareness of water fees and their experience in paying them, their experience in operation and maintenance of water supply facilities, and awareness-raising activities for use of the facilities. The second round included awareness-raising activities for the residents, gaining their consent to paying water charges, discussion and determination of water charges, selection of WSSB members who would be responsible for the operation and maintenance of the project's facilities, and training of facility operators. A test operation was carried out during the second round, and it was found that the training was not sufficient, so an additional two-month training was carried

out. During the ex-post evaluation, questions were asked to responsible officials of the Ministry of Water and Environment, and they believed that this component had been effectively implemented. According to the defect inspection report conducted one year after completion of the project, facility operation and fee collection by the WSSB were implemented without any problem at every RGC.

Interviews carried out during the ex-post evaluation with residents who participated in this component in Kameke, Kapala, and Nambale revealed that they remembered the instructional items and content of the component well; and showed that the knowledge and skills they acquired were useful. The WSSB's books of accounts reviewed in Nambale indicated that the knowledge acquired in this component was used to operate pumps, read meters, collect fees, and record the flow volume of pumps and distribution reservoirs. On the other hand, some RGCs did not collect fees or record flow volumes adequately. From the above, it can be concluded that this component was generally implemented effectively, and developed outcome to some extent.

[Undertakings of the Government of Uganda] The Ugandan government conducted its undertakings, such as the tax payments, obtaining construction and labor permits, installation of commercial electricity, and acquisition of the land for the project without any problems. There was a delay in notifying JICA about how to apply for the tax exemption. Chlorine dosing machines were not purchased at the time of completion of the project.[10] From the above, it can be said that the items to be borne by the Ugandan government were generally implemented as planned.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

The planned project cost was 1,706 million yen from Japan and 203 million yen from Uganda, totaling 1,909 million yen. The actual cost was 1,612 million yen from Japan and 64 million yen from Uganda, totaling 1,676 million yen, which was within the plan (88% of the plan). The reason why the actual project costs from Japan were lower than the plan was due to the results of the competitive bidding. The reason why the actual project costs from Uganda were lower than the plan was mainly because the amount of taxes borne by Uganda for implementation of the project was less than estimated in the plan.[11]

[10] The Ministry of Water and Environment planned to purchase chlorine dosing machines as needed at the time of the ex-post evaluation,

[11] The Ministry of Water and Environment was exempted from paying corporate income tax incurred in Uganda to the Ministry of Finance during the project. For the purpose of this evaluation, this was considered to have been paid by the Ministry of Finance and added to the project cost of Uganda. The amount of corporate income tax paid, 1.2 million shillings, was less than the planned amount of 5.2 million shillings, but the reason for this was not clear.

3.2.2.2 Project Period

The planned project period for this project was 26 months, from May 2017 to June 2019.[12] The actual result was 26 months from May 2017 to June 2019, which was within the plan (100% of the plan).

Outputs were as planned; the project cost and period were within the plan. Therefore, efficiency of the project is very high.

## 3.3 Effectiveness and Impacts[13] (Rating: ②)

### 3.3.1 Effectiveness

#### 3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

The project set the water supply volume and water quality of facilities of the project as operation and effect indicators to measure if the project achieved its objective, improvement of water supply services. Table 3 summarizes the actual results and the status of target achievement.

**Table 3: Plan and Actual of the Operation and Effect Indicators and Status of Target Achievement**

| Indicators | Baseline value | Target value | Actual value | Status of target achievement |
|---|---|---|---|---|
| | 2015 | 2022 | 2023note (2) | |
| | - | 3 years after completion | 4 years after completion | |
| Water supply volume by the facilities of the project ($m^3$ /day) | 0 | 581 | 103.7 | 18% |
| Water quality (turbidity: NTU) of the facilities of the project | No data | 25 or less | 25 or less | 100% |

Source: Materials provided by E-UWS

Notes:

(1) Neither water supply nor turbidity data were available until three years after project completion, so they are not shown in the table above.

(2) Actual value of water supply volume was compiled by obtaining data from August 2022 to July 2023, the most recent data available at the time of the ex-post evaluation and calculating the daily averages. Water quality is the result of testing conducted by E-UWS in September 2023.

[Indicator 1: Water supply volume]

The water supply volume indicator was defined as "the average daily water use of the residents, not including leakage and other losses." The target value was set by multiplying the estimated

[12] The project start was defined as signing of the Grant Agreement, and completion was defined as the start of provision of the facility for both plan and actual.

[13] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

population in 2022 within the water supply area in each RGC by the average daily water demand per capita.[14] The average daily water use per capita was calculated using the water demand defined in the rural water supply manual of Uganda.[15]

The WSSBs were responsible for the operation and maintenance of the water supply facilities of the project, but because some WSSBs were not managing them adequately, the Ministry of Water and Environment issued a notice in the name of the Minister in September 2022, transferring responsibility for operation and maintenance of the water supply facilities to the E-UWS.[16] Therefore, this ex-post evaluation had to obtain water supply records from both the WSSBs and the E-UWS. However, data on sales volumes during the management of WSSBs were available only for Nambale. Therefore, it was determined that the average daily water supply volume for the project's facilities up to three years after completion was not known.[17] Data on water sales from August 2022 to July 2023, four years after the project's completion and the most recent period at the time of the ex-post evaluation, were relatively complete

Table 4 shows the data for water supply volume in the fourth year after project completion (August 2022 to July 2023), which was compiled from this water sales data. The average daily water supply volume in each RCG was 3.9 $m^3$ - 21.3 $m^3$, and the total of the 9 RGCs was 103.7 $m^3$. The target achievement rate for each RGC ranged from 9% to 54%, with an overall rate of only 18%. The target was not achieved.

[14] The water supply area for the project was selected to be centrally located in the target RGCs, with a relatively high population density and including public facilities such as schools and hospitals.

[15] Twenty liters/day/person was used for the demand in all RGCs apart from Kasassira, where the population would be 5,000 or less; 35 liters/day/person was used for Kasassira RGC where the population would be 5,000 or more. Reference: the average daily per capita water demand in Tokyo is 214 liters/day/person (Source: website of the Tokyo Metropolitan Government Bureau of Waterworks; accessed September 17, 2023.
https://www.waterworks.metro.tokyo.lg.jp/faq/qa-14.html#2)

[16] See "Reason (1) Water supply was suspended for some periods" on page 13 for details on how the transfer was made.

[17] The E-UWS explained that at the time of the transfer, the sales record books were either not submitted or could not be tabulated due to missing data even if they had been submitted. The evaluator obtained water sales volumes of the RGCs of the period after the facilities were transferred to and repaired by the E-UWS, and collection of water bills had started. The evaluator studied the sales record and obtained the volumes from May 2022 to December 2022 from the water supply system operator of WSSB in Nambale during the ex-post evaluation - where the transfer process took place later than other RGCs. However, in Nambale, meter reading and water bill collection were suspended from January to May 2023 during the transfer process, so the volume of water sales during this period was not available.

**Table 4: Details of Water Supply Volume Four Years after the Project Completion (August 2022 - July 2023)**

| RGC | Monthly water supply 2022 (㎥) | | | | | Monthly water supply 2023 (㎥) | | | | | | | Annual water supply (㎥) | No. of months data was available | Monthly average (㎥ /month) | Daily average (㎥/day) | Target amount (㎥/day) | Achievement rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | | | | | | |
| Nambale | 570 | 433 | 438 | 350 | 433 | n/a | n/a | n/a | n/a | n/a | 276 | 490 | 3,561 | 6.5 | 548 | 18.0 | 37 | 49% |
| Lambala | 158 | 114 | 17 | 10 | 27 | 100 | 183 | 204 | 173 | 112 | 148 | 176 | 1,422 | 12 | 119 | 3.9 | 35 | 11% |
| Naigobya | 132 | 212 | 119 | 185 | 252 | 251 | 324 | 324 | 307 | 210 | 271 | 281 | 2,868 | 12 | 239 | 7.9 | 34 | 23% |
| Kyanvuma | 554 | 464 | 519 | 528 | 433 | 433 | 789 | 787 | 679 | 534 | 912 | 1,149 | 7,781 | 12 | 648 | 21.3 | 65 | 33% |
| Buseta | 0 | 0 | 0 | 0 | 0 | 0 | n/a | 259 | 252 | 322 | 245 | 345 | 1,423 | 11 | 129 | 4.3 | 46 | 9% |
| Kasassira | 0 | 0 | 0 | 0 | 0 | n/a | 1,519 | 1,163 | 1,027 | 944 | 781 | 1,005 | 6,439 | 11 | 585 | 19.2 | 199 | 10% |
| Kameke | n/a | n/a | n/a | n/a | n/a | n/a | 413 | 687 | 568 | 408 | 519 | 485 | 3,080 | 6 | 513 | 16.9 | 31 | 54% |
| Kapala | 0 | 0 | n/a | n/a | n/a | n/a | 313 | 145 | 162 | 177 | 248 | 259 | 1,304 | 8 | 163 | 5.4 | 55 | 10% |
| Kidetok | n/a | 0 | 0 | 0 | 0 | n/a | n/a | 254 | 308 | 299 | 440 | 591 | 1,892 | 9 | 210 | 6.9 | 79 | 9% |
| Total | 1,414 | 1,223 | 1,093 | 1,073 | 1,145 | 784 | 3,541 | 3,823 | 3,476 | 3,006 | 3,840 | 4,781 | 29,770 | 88 | 3,155 | 103.7 | 581 | 18% |

Source: Materials provided by E-UWS, site inspection.

Notes:

(1) Months in which water supply was suspended for more than one month due to facility failure were considered to have zero water supply.

(2) Annual water supply and average daily water supply are calculated only for the months for which data are available.

(3) June 2023 for Nambale represents the water supply for the half month from June 14 to June 30, when meter reading began.

(4) Water sales volume of the facilities of the project is considered as water supply volume in this ex-post evaluation.[18]

Reasons why the water supply volume was less than the target.

There are three main reasons why the water supply volume was less than planned:[19]

(1) Water supply was suspended for some periods.

(2) Provision of house connections was delayed.[20]

(3) Some residents are using other water sources as their primary water source.

[18] The sales volume does not include the volume of water supplied but not measured or billed because water meters did not detect the water supply, or if the meters were not installed. Yet, there is no problem in this evaluation in considering the sales volume as water supply volume, since the data for water supply volume other than Nambale are the ones after the transfer to E-UWS, and this is after the meters have been repaired or updated. For Nambale, sales volume data up to December 2022, which was managed by the WSSB, is included in Table 4. This sales volume can be considered as the water supply volume since the management and meter reading by the WSSB was conducted well in general. To confirm the reliability of the figures for water supply volume, the amount of water distributed by the project's facilities was calculated by adding up the values on the flow meters installed on the water pumps. The average of the total amount of water distributed in the 9 RGCs from the start of facility use until the time of the ex-post evaluation (July 2023) was 138.9 $m^3$ /day. The water supply volume is equivalent to 75% of this water distribution volume. The "Study Report for Kyoga Water Supply facilities (February to March 2023)" of the JICA Expert – an Advisor on Rural Water Supply in Kenya - reported leaks and theft of water from the water transmission and distribution lines. The actual water supply volume (103.7 $m^3$ /day) is largely a reliable value when considering these losses.

[19] The population of the water supply areas at the time of the ex-post evaluation is considered to have been increased as per the estimation at the time of planning. Therefore, the population did not affect the status of achievement of the indicator. According to interviews with staff of E-UWS and officials of town councils, the population of the water supply areas of the project has increased compared to that at the time of planning. Many people have moved into the area for employment and business opportunities, since the area of the project is being developed with electricity and water supply, roads, and schools, and there has been natural increase due to births. The planned population of the water supply area estimated at the time of planning was 24,734 in total.

[20] House connection refers to the connection of service pipelines and installation of water taps and meters in the household premises.

Reason (1) Water supply was suspended for some periods.

Figure 1 shows that water supply was intermittent or stopped for several months up to more than 2 years in 6 of the 9 RGCs, as water supply facilities failed, and repairs were delayed.

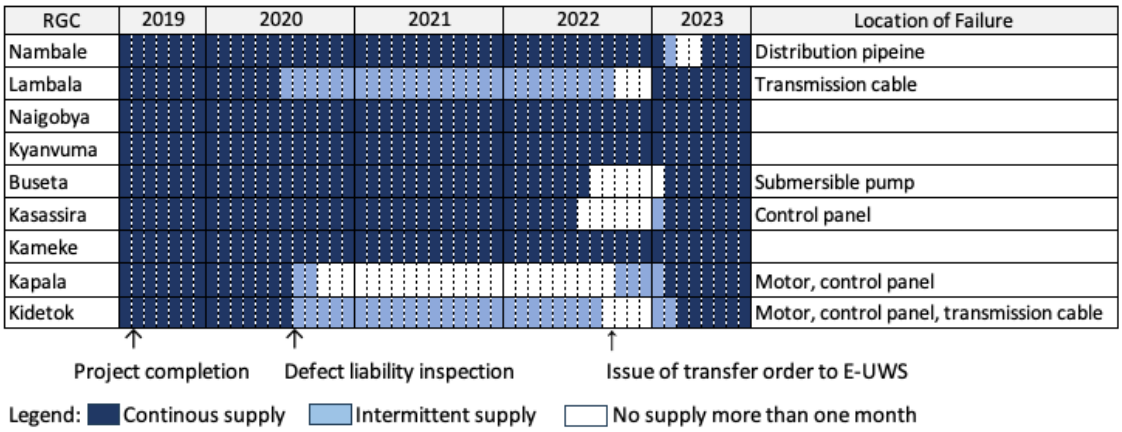



**Figure 1: Status of Operation of the Water Supply Facilities**

Sources: Materials provided by E-UWS, interviews with E-UWS staff and former WSSB members, defect liability inspection report, materials provided by JICA.

Note: It was assumed that all RGCs had a continuous water supply until July 2020, because the defect liability inspection report issued in July 2020 stated that all facilities were in operation without problems, and no reliable information contradicting this statement was found.

In Lambala, Kapala, and Kidetok, water supply was intermittent or stopped for more than two years due to facility failures and delays in repair because of the following circumstances.

- In Lambala, the transmission cable connecting the solar power generation facility and a water pump was damaged and disconnected during road construction. The WSSB repaired it, but inappropriate materials used for the repair caused a leakage at the connection of the cable. In addition, leakages occurred at another location where the transmission cable is buried in a swamp and submerged in water for a long time. The WSSB operated the facility intermittently while repairing these leakages, but repeated leaks in October 2022 damaged the inverter, which completely shut off the water supply.
- The control panel failed due to fluctuations in commercial power voltage in Kapala and Kidetok. This problem could not be resolved adequately, even though the contractor of the project installed an AVS (Automatic Voltage Stabilizer) in the panel after the project was completed. In Kidetok, sunlight raising the temperature inside the control panel, and vandalism, also caused the control panel to fail.

The repairs were delayed due to a delay in the Ministry of Water and Environment re-establishing the operation and maintenance system of the water supply facilities of the project, due to Covid-19. The WSSBs, which were responsible for the operation and maintenance of the facilities after completion of the project, were able to operate and maintain the facilities on a daily basis but were not able to adequately repair the facilities and promote the house connections. The

Ministry was scheduled to support and intervene when major repairs were needed. Sometime after completion of the project, the Ministry recognized that some WSSBs had failed to repair their facilities and had stopped supplying water. Therefore, they began to study the possibility of transferring this responsibility from the WSSBs to the E-UWS, in order to rebuild the operation and maintenance system. However, the study and decision to transfer the responsibility took time. It required research and analysis of the current status of the operation and maintenance of the WSSBs, consultation with the sub-counties that own the facilities, and confirmation that the E-UWS had the capacity to take over the operation and maintenance of the facilities. However, the Ministry was unable to proceed with these tasks expeditiously due to Covid-19. Specifically, restrictions on the movement of Ministry staff[21] and Ministry budget cuts (discussed in the Sustainability section) affected the delays.

In September 2022, the Ministry sent out a gazette notification of transfer, and E-UWS immediately assigned the necessary personnel to each RGC for operation and maintenance, conducted a survey of the current condition of the water supply facilities, and made the necessary repairs. For example, in the three RGCs mentioned above, where water supply had been suspended for a long period of time, all damaged, malfunctioning, or destroyed components, including motors, liquid relays, timers, and circuit breakers, were replaced with new ones. In addition, new phase monitors were installed at various locations to prevent electrical components in pumps and motors from being damaged by extreme voltage fluctuations. Commercial power was used to operate the pumps in Lambala, as it was difficult to resolve the leakage in the transmission cable quickly.

Figure 2 shows the 1-year trend of water supply volume in the fourth year after project completion. 24-hour water supply was achieved; meter readings, collecting and recording of fees were properly done; and water supply volume increased drastically after February 2023 when facilities were repaired after the transfer to E-UWS.

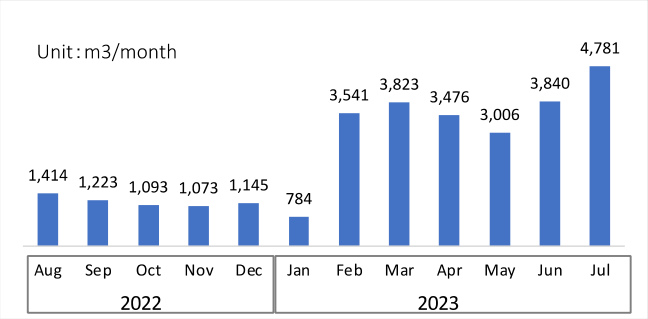



**Figure 2: Water Supply Volume in the 4th Year of Project Completion - Total of 9 RGCs**

Source: Materials provided by E-UWS, site inspection.

[21] A lockdown was imposed on March 25, 2020, in Uganda, with a total ban on work attendance and travel. This was relaxed at the end of 2020, but attendance and travel remained restricted. Due to a further outbreak, a partial lockdown was re-imposed from August 2, 2021, to February 7, 2022, limiting work attendance to 20% of the workforce and travel up to 3 persons per vehicle.

Reason (2) Provision of house connections was delayed.

The delay in the increase in water usage, which was expected to happen after house connections were installed, was one reason why the water supply volume was less than planned. In general, households with a house connection tend to use more water than before getting it due to the increased convenience. The creation of this effect was delayed for the project. The Ministry of Water and Environment had planned to start house connections immediately after completion of the project,[22] but, as mentioned above, this was delayed due to the influence of Covid-19. The Ministry started installing house connections in early 2022 after restrictions on movement due to Covid-19 were lifted. Subsequently, installation was further promoted by the E-UWS, and at the time of the ex-post evaluation, a total of 661 households had obtained house connections as at the end of September 2023. This represents 13% of the total number of households in the water supply area of the project.[23]

Reason (3) Some residents are using other water sources as their primary water source.

A household survey was conducted to determine the current status of residents' water use considering that there may be a number of residents in the water supply area who use other sources of water rather than water from the project's facilities.[24] The 45 households surveyed identified their primary water sources as “wells with hand pumps” - 36 households, “kiosks” - 6 households, “springs” - 2 households, and “house connection in neighbourhood” - 1 household (see Figure 3). It is evident that a certain number of residents choose inexpensive wells with hand pumps and springs as their primary water source, despite the time and labor required. When the evaluator asked why the 38 households that are using wells with hand pump or springs as their primary water source, despite the kiosk being closer, all said because it is cheaper. And they wanted to "save money and use it to buy food and daily necessities."[25]

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[22] The house connections for specific beneficiaries are generally made by the executing agency in Grant Assistance projects of JICA.

[23] The number of households in the water supply area of the project, 5,048, was calculated by dividing the population of the area in 2022, 24,734, which was estimated in the preparatory study of the project, by 4.9, which is the average size of a household in the Uganda National Population and Housing Census 2014.

[24] From September 19 to September 23, 2023, a total of 45 households, 5 in each RGC, which are in the water supply area of the project and did not have house connections, were visited, and interviewed about their water use and labor to fetch water. The sample was selected using a quota sampling method, to be dispersed throughout the area. The respondents consisted of 26 women and 19 men – 45 in total, ranging in age from 21 to 85, with an average age of 40. This survey was conducted three weeks after the start of the rainy season and asked about the current situation. Therefore, the survey results are considered as water use during the rainy season.

[25] The water charge at the kiosk is 100 shillings per jerrycan (a jerrycan is a polyethylene tank used for fetching water and has a capacity of 20 liters). According to observations made during the household survey, each household uses about 6 to 10 jerrycans of water per day. If all this water were supplied by kiosks, it would cost 600 to 1,000 shillings per day. On the other hand, they do not pay for water from wells with hand pumps, but only pay a fee for repairs to the manager when the well breaks down or pay a usage fee of 1,000 to 2,000 shillings per month. For this reason, residents feel that water from the kiosks is more expensive than water from wells with hand pumps.

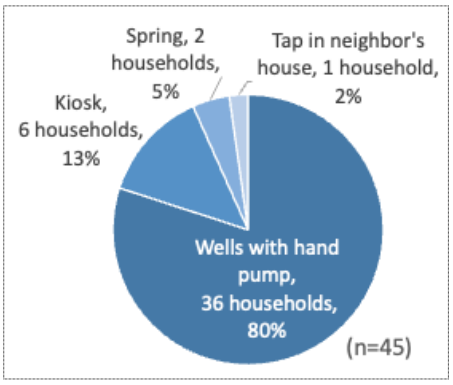


**Figure 3: Primary Source of Water for Households in the Water Supply Area**

Source: Household survey in the ex-post evaluation

Well with hand pump in Kameke

Spring in Kidetok

Photos: Taken by the external evaluator

The household survey found that of the 39 households that primarily use water sources other than kiosks, 23 households (59%) use the kiosks as a supplementary water source. These households obtain water from the kiosks when they are tired and do not want to go far to fetch water, when they suddenly find no water at home or are in urgent need of water, or when their wells with hand pumps are broken.

The wells with hand pumps, that had been used before the project, are continuously used by many households as the primary source of water, possibly because their confidence in the water supply facilities of the project did not increase as they did not supply water continuously.[26]

The evaluator counted the number of wells with hand pumps in the water supply area of the 9 RGCs and found there were 34 at the time of planning, and 77 at the time of the post-evaluation. This increase in the number of wells with hand pumps is also the reason for continued use of the wells. There were some wells with hand pumps constructed after 2019, and some were adjacent to kiosks. It is possible that residents requested the installation of wells with hand pumps at a time when the project's facilities were no longer supplying water, or that the wells were newly constructed without considering the duplication with the kiosks. Note that neither the Ministry of Water and Environment nor the E-UWS encourage the installation of wells with hand pumps, and it is unlikely that new wells with handpumps will be constructed in the future.

The number of water supply facilities of the project in use at the time of the ex-post evaluation

[26] A report provided by JICA on a survey conducted in March 2023, “Data Collection Survey on Kyoga Grant Assistant Project Sites in Eastern Uganda," states the result of the group discussions as, "By and large, 90% of the groups revealed that the unreliability of the water systems was attributed to the continued and frequent breakdown hence forcing them to resort to the available alternatives.” The survey was conducted from December 2022 to March 2023 by a Ugandan consulting firm, GOAM Consultants Ltd. on behalf of the JICA Uganda office. Information was collected from stakeholders of the project, and group discussions were held with users of the project. The group discussions were held in each RGC, and participants included 25 users with house connections and 35 kiosk users. The sample was purposely selected. Gender breakdown and age groups of the samples were not stated and are unknown.

was studied as a reference indicator of effectiveness (Figure 4). There were 661 house connections at the time of the post-evaluation (Figure 5). In addition to this, there were a total of 177 locations in the 9 RGCs that were under installation or scheduled for installation.[27] 88 yard taps in public facilities of the 99 installed by the project were in use (89%).[28] A total of 92 yard taps were in use including the 4 yard taps newly installed after the project (Figure 6). 63 of the 70 kiosks constructed by the project continue to be used (90%) (Figure 7). [29] As mentioned above, kiosks are supposed to be considered a supplementary water source. In this way, the water supply facilities installed by the project are generally in continuous use, and house connections have been installed positively.

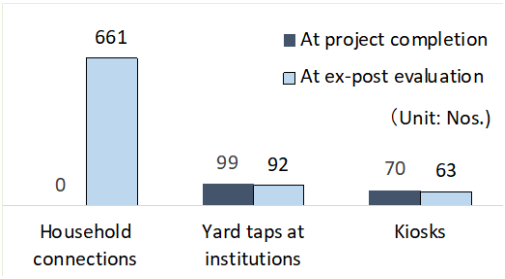


**Figure 4: Number of Water Supply Facilities in 9 RGCs**

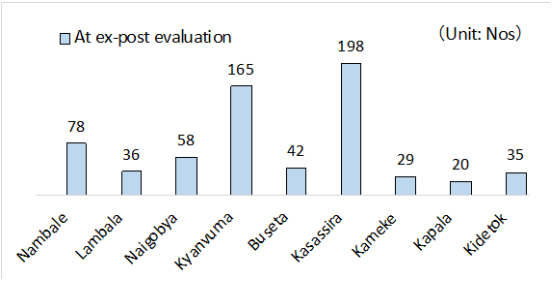


**Figure 5: Number of House Connections at the time of Ex-post Evaluation**

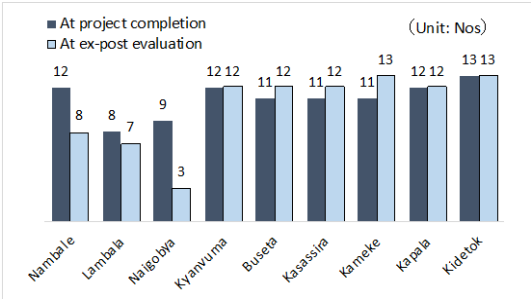


**Figure 6: Number of Yard Taps at Public Institutions**

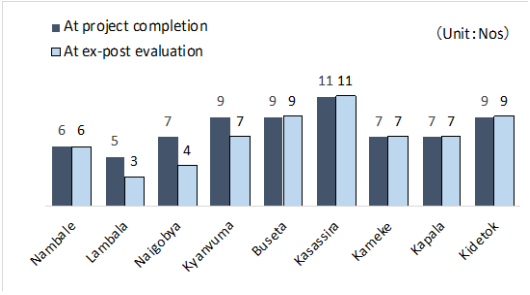


**Figure 7: Number of Kiosks**

Source: Materials provided by E-UWS, site inspection.
Note: A public stand post was installed in Kameke after the project. This was omitted in the above figures as there is only one.

[27] Of the 177 locations, 127 were from the new connection promotion campaign conducted by the Ministry of Water and Environment. The normal cost of a house connection is 118,000 shillings, while the campaign's connection cost is 50,000 shillings with a discount. At the time of the ex-post evaluation, the Ministry was implementing the campaign in Kameke, Kapala, and Kidetok, and planned to implement it in Lambala, Naigobya, and Buseta.

[28] Eleven yard taps installed by the project had been closed. The reasons for this were, for example, the yard taps were no longer used because the wells with hand pumps that were also being used had sufficient water flow, and the facilities where the yard taps were installed had been closed.

[29] Seven kiosks had been closed due to either a decrease in demand for kiosks due to increased house connections in the vicinity, or due to the E-UWS shutting off them due to non-payment of water bills. The latter will be reopened if desired by residents and a new kiosk attendant is identified (the evaluator observed an example of this in Lambala during the ex-post evaluation). The number of kiosks is likely to continue to change. They may not be used when the house connections increase. They may be used more if the wells with hand pump that are competing with kiosks break down or have a reduction in water quantity or deterioration in quality.

[Indicator 2: Water quality]

Turbidity, representing water quality, was set as an indicator of the project. The target was to keep it below 25 NTU, as per the drinking water quality standard in the country.[30] No data was available from the time of project completion until the transfer to the E-UWS, because water quality testing was not conducted during this period. Water testing was conducted two or three times at each RGC after the transfer to the E-UWS (Table 5). Turbidity levels at all RGCs were below the standard values and the target was met.

The evaluator has studied other parameters of the testing and found that all RGCs met standards for residual chlorine, colour, pH, temperature, hardness, iron, fluorine, TDS (total dissolved solids), and salinity.

**Table 5: Results of the Water Quality Testing - Turbidity**

| RGC | Target | Test results | | | Target Status |
|---|---|---|---|---|---|
| | Turbidity (Unit: NTU) | Turbidity (Unit: NTU) | Number of samples (locations) | Sample Collection Date | |
| Nambale | 25 or less | 0.12 - 1.39 | 4 | September 29, 2023 | Achieved |
| Lambala | do | 2.57 - 6.56 | 2 | March 31, 2023 | Achieved |
| | do | 1.40 - 1.65 | 3 | September 29, 2023 | Achieved |
| Naigobya | do | 1.24 - 1.65 | 3 | September 29, 2023 | Achieved |
| Kyanvuma | do | 0.79 - 1.35 | 2 | March 31, 2023 | Achieved |
| | do | 0.67 - 0.93 | 3 | September 27, 2023 | Achieved |
| Kasassira | do | 0.16 - 0.49 | 4 | September 27, 2023 | Achieved |
| Kameke | do | 0.45 - 0.69 | 3 | September 27, 2023 | Achieved |
| Kapala | do | 0.91 - 2.59 | 5 | March 29, 2023 | Achieved |
| | do | 0.10 - 0.18 | 3 | September 27, 2023 | Achieved |
| Buseta | do | 0.25 - 0.61 | 3 | September 27, 2023 | Achieved |
| Kidetok | do | 0.10 - 0.67 | 4 | September 5, 2023 | Achieved |

Source: Materials provided by E-UWS.

However, Escherichia coli (E. coli) was detected at 6 RGCs during testing conducted in September 2023. Detection counts ranged from 1 to 47 CFU/100 ml[31] (Table 6). Since the deep wells that constructed by the project draw water from deep underground water further below the

[30] The evaluator assumes that turbidity was chosen among the other parameters of water quality, as an indicator to measure the effectiveness of the project, since the social survey conducted at the time of planning showed that the highest percentage of respondents (52%) cited color as a problem in water quality (Source: p. 103, Socioeconomic Survey in Selected 12 RGCs, attached to the Preparatory Study Report, March 2016). NTU stands for Nephelometric Turbidity Unit, a unit of turbidity commonly used in the United States, which is also used in Uganda.

[31] The standard for E. coli count in drinking water in the country is zero (undetectable). All samples tested in September 2023 were collected at consumption points, such as taps at house connections, kiosks and yard taps at public institutions. E. coli count is calculated by incubating the water sample in a culture medium and counting the number of colonies that have developed. For example, 10 CFU/100 ml means that there are 10 cultured colonies per 100 ml of water being tested.

water-tight strata, it is highly unlikely that contaminated water from agricultural land or rainwater surrounding the deep wells could have contaminated the water source. It is highly likely that contaminated water from outside the pipes flowed in during pipe extension work, at the time of interruption to water transmission and suspension of water supply.[32]

E-UWS dispatched response teams to the RGCs where E. coli was detected, regularly chlorinated elevated water tanks, educated residents about boiling drinking water, and also provided water quality management training to the scheme management teams. The testing was conducted again from November 29 to December 1, 2023, and showed that E. coli was detected at five RGCs, but the number detected was 1-5 CFU/100 ml. This confirmed improvement due to the chlorine input (Table 6). E-UWS is also installing water taps to test the quality of water at sources to investigate the process and causes of contamination. Water quality testing at sources was carried out in Lambala, Naigobya, Kasassira and Kameke during the above testing. No E. coli was detected in any of them.

E-UWS's planned long-term measures include continued chlorine injection into elevated water tanks, regular water quality testing, and the installation of outlets for flushing water to clean wells of water sources. Water quality is expected to improve in the future by implementing these pollution control measures, and the continuous water quality monitoring.

**Table 6: Results of E. coli Test Conducted by E-UWS**

| RGC | Tests conducted from September 27th to September 29th, 2023 | | | | | Tests conducted from November 30th to December 1st, 2023 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of samples (locations) | Number of E. coli detected (Unit: CFU/100ml) | | | | Number of samples (locations) | Number of E. coli detected (Unit: CFU/100ml) | | | |
| | | Sample 1 | Sample 2 | Sample 3 | Sample 4 | | Sample 1 | Sample 2 | Sample 3 | Sample 4 |
| Nambale | 4 | 0 | 0 | 2 | 2 | 3 | 0 | 0 | 0 | - |
| Lambala | 3 | 27 | 41 | 47 | - | 4 | 0 | 0 | 2 | 4 |
| Naigobya | 3 | 0 | 0 | 1 | - | 3 | 0 | 0 | 0 | - |
| Kyanvuma | 3 | 0 | 0 | 0 | - | 3 | 0 | 0 | 0 | - |
| Kasassira | 4 | 7 | 9 | 11 | 13 | 3 | 0 | 1 | 0 | - |
| Kameke | 3 | 0 | 0 | 3 | - | 3 | 0 | 1 | 0 | - |
| Kapala | 3 | 0 | 0 | 0 | - | 3 | 1 | 0 | 0 | - |
| Buseta | 3 | 0 | 0 | 0 | - | 3 | 5 | 0 | 0 | - |
| Kidetok | 4 | 2 | 2 | 4 | 4 | 3 | 0 | 0 | 0 | - |

Source: Prepared by the evaluator based on inspection reports provided by E-UWS.

[32] Shallow wells draw water from aquifers (strata saturated with groundwater) several meters underground, so there is a possibility of contamination from the ground surface. On the other hand, the deep wells developed in this project have an intake depth of at least 17 m, and the casing - a pipe inserted to prevent the well from collapsing - is protected by concrete up to 5 m below the ground surface. Therefore, unless the well itself is submerged in water due to flooding, etc., the possibility of contamination of the wells by water from surrounding agricultural land or sewage is extremely low. The water quality of the deep wells of the project was tested at the time of construction, and no E. coli were detected at that time. No submergence has occurred either.
In Kidetok, during the construction of a distribution pipeline extension, a pipe was accidentally cut while supplying water, resulting in a large leakage that may have introduced contamination to the water supply. Generally, when there is a water supply suspension or disconnection, the pressure inside the pipes drops, and surrounding water with contamination may be sucked in from pipe-joints and other parts. Therefore, it is desirable to disinfect the water by regularly adding chlorine into the elevated tanks.

### 3.3.2 Impacts

#### 3.3.2.1 Intended Impacts

The project was expected to have an impact of "improving the living environment by improving the water supply situation." As indicators to measure this, the project was expected to reduce 1) the amount of labor required to fetch water, and 2) the number of water-borne diseases due to the supply of hygienic drinking water.

1) Reduction of labor to fetch water.

Seven general households obtaining water from the facilities of the project, including house connections and kiosks, were visited as case studies to study if there are any examples of reducing labor to fetch water due to the project.[33] The study found that labor to fetch water was reduced in all the households visited, with remarkable changes at households with house connections. For example, a household in Kidetok with a house connection used to fetch water from a spring about 1 km away three times a day, each time taking 1 hour. As they got older, this became more and more difficult. Now they can get as much water as they want and they do not have to go to the spring to fetch water, which is very helpful for them.

A woman at a house with a house connection in Kasassira was able to spend more time working in the agriculture fields due to spending less time and effort fetching water. There were also examples of children having more time to study, and self-employed people being more efficient in their business (see below columns).

**<Column> Impact on Study**

Interviewed a father in Nambale about the impact of the house connection on his 14- and 10-year-old children's studies, September 23, 2023.

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A tap was installed at the back of my house in February 2022. It is as if my life has changed. It has become very convenient to have water available at any time. We are satisfied with the water quality and quantity. Previously, my daughters had to fetch water twice a day, once before school and once after school, from a well with a hand pump 500 m away. The older daughter would fetch water in two jerrycans (20 litters), and the younger in one. When there were a lot of people, it sometimes took two hours round trip. The girls have no longer had to do this work since the tap was installed, allowing them more time in the evening for their studies. In the past, I sometimes worried about sending them to fetch water. I no longer have to worry about that since the tap was installed.

[33] Case studies were conducted in 9 RGCs in June 2023 and September 2023. A total of 19 cases of residents, 9 women and 10 men, ranging in age from 30s to 70s, were studied.

**<Column>Impact on Self-Employment**

Interviewed a business owner in Kyanvuma about the impact of the house connection on his business of livestock raising and feed production and sales, September 22, 2023 (Photo taken by the evaluator).

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A water tap was installed in front of the livestock farm in September 2022. Previously, I had to draw water from a well with a hand pump about 50 m away across the road. It was a heavy burden to transport the water since I need a large amount of water for rearing livestock. The cost of purchasing a jerrycan of water was 500 shillings, which was expensive. I feel easier since I no longer need to fetch water, and happy that I can clean livestock sheds anytime since water is always available when I need it. Manufacturing and selling feed also became easier. As I can get water at any time, the work has become more efficient and sales are increasing.

Case studies of public institutions also confirmed examples of impact, including reducing time and effort to fetch water, and promoting service operations and education. For example, a public health center in Kameke, where approximately 80 deliveries take place per month sometimes could not wash the delivery room and linen in the room immediately after deliveries previously, because there was no reserve water. They now have enough water to clean them after installation of a yard tap in the premises of the center.

2) Reduction of waterborne diseases through the provision of hygienic drinking water

An attempt was made to collect relevant information by visiting health canters in six RGCs.[34] There was no sufficient information on the number of incidence or morbidity rate of waterborne diseases in the water distribution areas of the project for pre- and post-project comparisons, so it was unable to analyze whether disease had decreased.[35]

[34] The evaluator visited health centers in Naigobya, Buseta, Kasassira, Kameke, Kapala, and Kidetok. The one in Nambale, Lambala, and Kyanvuma could not be visited due to time constraints.

[35] There were no reported outbreaks of waterborne disease in the water supply areas of the project in Kameke, Kapala, and Kidetok in 2022. In the other 3 RGCs visited, the number of outbreaks in recent years was not recorded and unknown. When asked about changes in the situation before and after the project, the managers of the health centers replied that waterborne diseases had hardly occurred in recent years, and had decreased after the project (3 respondents); that they do not know because they were not working there before the project (2 respondents); and that they did not think there was any change (1 respondent). Statistics from the Ministry of Health of Uganda were also studied, but no data were available on waterborne diseases in the water supply area of the project.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

The project does not fall under sector of the large water supply stated in *the JICA Guidelines for Environmental and Social Considerations (April 2010)* and was judged to have no significant undesirable effects on the environment. The project area also does not fall under the sensitive characteristics and sensitive areas listed in the Guidelines. According to the information obtained from the environmental monitoring reports of the project, consultants of the project and the Ministry of Water and Environment, the mitigation measures for air pollution, waste, noise and vibration, traffic accidents, HIV/AIDS, and work environment planned according to the environmental screening at the time of planning were implemented as planned. Noise and vibration were within the standard values, and there were no problems occurred regarding road traffic accidents, HIV/AIDS, or the working environment. There were no negative environmental impacts, or complaints from the residents.

2) Resettlement and Land Acquisition

No resettlement has planned nor occurred. Land acquisition had already been carried out at the time of project planning by 20 residents who donated a total of 3,052 $m^2$ of land free of charge, as is customary in Uganda. Each landowner has agreed to the land donation and signed a letter of acceptance. The locations of the kiosks in Nambale and Lambala were changed, because the two landowners revised their agreement during the construction - although they had not raised any issues about the acquisition at the time of the agreement.[36] The publicly owned land was provided without any problems.

3) Gender Equality

The project also contributes to women's leadership development and employment opportunities in non-traditional occupations (see column).

[36] According to the Preparatory Study Report, the land donation implemented under the project met the requirements for free donation defined in the World Bank's Guidelines for Voluntary Land Donation. These requirements include that the land donor is located within the beneficiary area of the project. However, a JICA expert dispatched in 2017-2019 reported that there were cases (the number of people is unknown) where the land donor for the water source was located outside the water supply area of the project and withdrew their provision after giving consent, or where acquisition negotiations were difficult. The E-UWS installed one public water tap in Kameke, which was in response to a request from a land donor located outside the water supply area. There were some instances where the requirements for voluntary donation were not met, which appeared to have been addressed after the project was completed. The external evaluator asked the Ministry of Water and Environment about the current situation during the ex-post evaluation. They said that the customary practice in Uganda is still to donate land free of charge, but, as urbanization progresses and the value of land increases, there are frequent cases where the donors are not satisfied, and negotiations are difficult. They said that land acquisition should be carried out by providing compensation in the future. In Uganda, land acquisition with compensation has been introduced in road construction projects, and there are also examples in water supply projects supported by the Asian Development Bank.

**<Column> Providing Opportunities for Women to Find Employment in Non-Traditional Occupations**

E-UWS is committed to gender mainstreaming, and three female team leaders and two plumbers were assigned to the scheme management teams for the project's facilities at the time of the ex-post evaluation. The placement of women in leadership positions and non-traditional occupations is noteworthy. E-UWS is also conducting gender awareness activities targeting the local population to promote the acceptance of women staff among them.

4) Marginalized People

Examples were identified in the case studies, such as an elderly person who had difficulty fetching water but now felt less tired due to the project, and a person who used to ask others to fetch water because of her disability but is now able to obtain water by herself at any time without depending on others.

5) Social Systems and Norms, Human Well-being, and Human Rights

Examples were identified in the case studies where the project has enabled people to have access to water at any time, freeing them from the worry and psychological stress of running out of water.

As described above, the actual water supply volume from the project was much lower than the target, and the project effects were only realized to a certain extent compared to the plan, but this was largely due to the impact of the Covid-19 pandemic. As for water quality, the turbidity, which was the indicator, was below the standard value at all RGCs, and achieved the target. Immediate measures were taken at the RGCs where E. coli was detected, and the prospects for improvement are high. The expected impact of the project, such as reducing the time and effort needed to fetching water and improving the living environment, has been realized. This project has achieved its objectives only to a certain extent. Therefore, effectiveness and impacts of the project are moderately low.

## 3.4 Sustainability (Rating: ④)

### 3.4.1 Policy and System

The Government of Uganda has placed the water and sanitation sector within the priority area of human resource development, with the goal of increasing the water supply rate in its *Third National Development Plan (NDPIII: 2020/21-2024/25)*. The Ministry of Water and Environment

is actively working to promote piped water supply in villages, with support from the UN Global Compact's "Water for People: Uganda" project.

The country has policies and institutions that support the sustainability of the project, and no problems have been observed.

### 3.4.2 Institutional/Organizational Aspect

As mentioned in the "3.3 Effectiveness and Impacts" section of this report, operation and maintenance of the project's water supply facilities was transferred from WSSBs to E-UWS in September 2022. E-UWS has departments of Commercial, Finance and Administration, Engineering, and Cluster Management Units in charge of operation and maintenance of the water supply facilities. It has 247 employees and overseas the operation and maintenance of 46 water supply facilities as of June 2023.

As shown in Figure 8, the operation and maintenance of the facilities of the project is carried out under a three-tiered system of Supervision Team, Maintenance Team, and Scheme Management Team. All of them have clear roles and responsibilities.

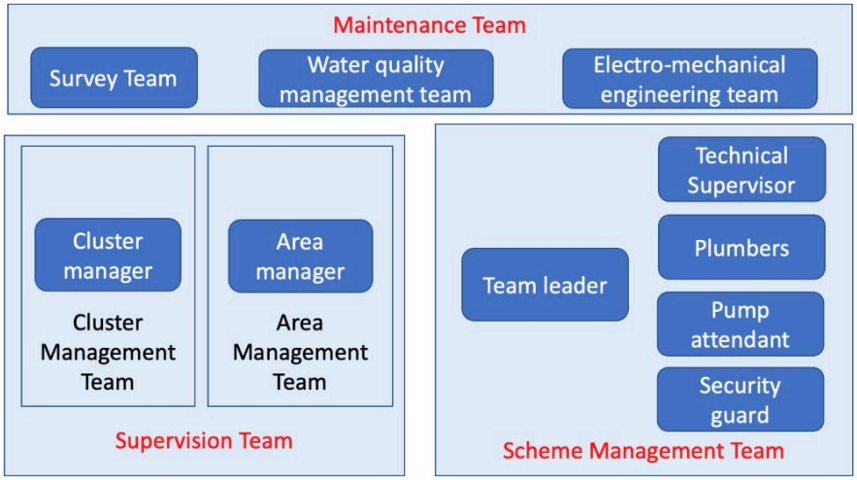


**Figure 8: Operation and Maintenance System of the Water Supply Facilities of the Project**

Source: Prepared by evaluator based on the materials provided by E-UWS.

- The Scheme Management Team is stationed at each water supply facility and is responsible for the operation and maintenance of the facility. The team is staffed by a team leader, technical supervisor, plumber, pump operator, and security guard. They are responsible for facility operation and inspection, billing and collection, minor repairs, facility expansion planning, and consumer awareness creation activities. Two to six staff are assigned to each Scheme Management Team of the 9RGCs, depending on the size and needs of the facility.[37]

[37] The Scheme Management Teams are staffed with the appropriate number of personnel as needed. For example, there is no technical supervisor or plumber if the scheme is small, but a person assigned to a neighbouring scheme can visit and respond as needed. A security guard is only assigned to a scheme with a solar power generation facility.

- The Supervision Team is responsible for supervising the Scheme Management Teams and assisting in problem solving.
- The Maintenance Team consists of the Surveying Team, the Water Quality Management Team, and the Electro-mechanical Engineering Team. The Survey Team is in charge of surveying, and the Water Quality Management Team is in charge of water quality inspections. The Electro-mechanical Engineering Team is in charge of professional repairs that require materials and equipment.

The Department of Water Development and its affiliated Urban Water Supply and Sanitation Division in the Ministry of Water and Environment are supervising the E-UWS. The roles and responsibilities of this division are clear, and it is staffed with the necessary personnel.

The responsibilities and roles of the operation and maintenance system of the facilities of the project are clear, the necessary personnel are assigned, and there are no issues that would pose a challenge to sustainability.

### 3.4.3 Technical Aspect

Staff of the Scheme Management Teams of E-UWS have been responsible for the operation and maintenance of the facilities of the project on behalf of the WSSB since September 2022. The members of the Team received necessary technical training from E-UWS before and after their appointment and have acquired the skills and knowledge required for operations, including facility inspection, repairs, and accounting. The WSSBs used to calculate water bills and payments with calculators and manage them manually in ledgers. After transfer to E-UWS, a computerized consumer information management and online water bill payment systems have been introduced. The Maintenance Team includes electrical and mechanical engineers and technicians who can inspect and repair electrical and mechanical facilities. E-UWS is actively training staff to improve capacity and transfer technology. For example, in the third quarter of 2022-23, programs on gender mainstreaming, asset mapping, study sessions on increasing water supply revenue, and training on air valves were conducted. There was no equipment or facilities which are not in use or used extremely infrequently due to technical problems at the time of the ex-post evaluation.

No technical problems were found in the operation and maintenance of the facilities of the project.

### 3.4.4 Financial Aspect

[Finance of E-UWS]

Figure 9 shows income and expenditure of E-UWS for the past three fiscal years. Both income and expenditure have increased, with income exceeding expenditure in each year.

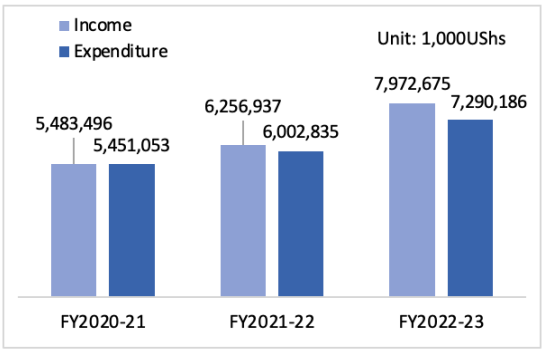


**Figure 9: Income and Expenditure of E-UWS for the Last 3 Fiscal Years**

Source: Prepared by evaluator based on materials provided by E-UWS.
Note: Uganda's fiscal year runs from July to June of the following year.

A breakdown of income and expenditure of E-UWS for FY 2021-22 is shown below.[38] The income items include government grants for implementing the "SCAP100 project"[39] that is implemented with the aim of improving water supply coverage rates, revenue from water supply, and government conditional grants.[40] Expenditure items include operation and maintenance of water supply facilities, administration, chemicals and consumables, consumer advocacy and sensitization, staff training, monitoring, and supervision.

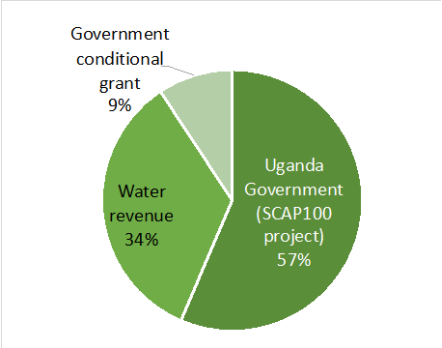


**Figure 10: Income of E-UWS (FY 2021-22)**

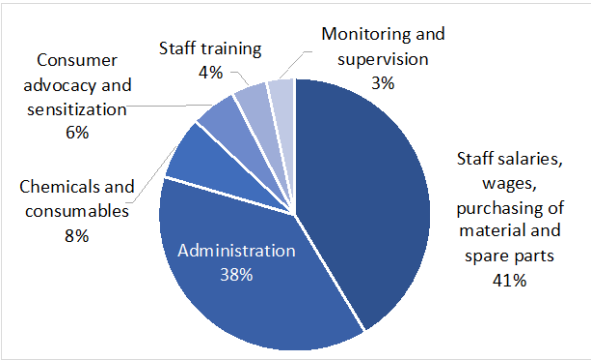


**Figure 11: Expenditure of E-UWS (FY 2021-22)**

Source: Prepared by evaluator based on materials provided by E-UWS.

E-UWS is a water utility that aims to meet the water supply needs of its residents through pro-poor water rates and relatively inexpensive house connection fees. Since it is difficult to operate solely on water supply revenue, the Ministry of Water and Environment allocates grants to E-

[38] A breakdown of revenue and expenditure for FY 2021-22 is presented because the financial statement for FY 2022-23 was not available at the time of the post-evaluation.
[39] Abbreviation for "100% Service Coverage Acceleration Project." A project by the Ugandan government implemented by the National Water and Sewerage Authority and the UWSs to achieve 100% service coverage.
[40] Grants allocated by the Ministry of Water and Environment to be used for specific purposes.

UWS annually.[41] In FY 2022-23, revenue from water supply increased by 119% over the previous year, and the recovery rate of water fees improved from 87% to 89%.

As noted above, E-UWS made repairs and upgrades to the project's facilities at the time of transfer, extended distribution lines, provided house connections, and paid outstanding electric bills.[42] The cost of these activities totaled 43.6 million shillings. E-UWS will continue to invest the necessary funds to operate and maintain the project's water supply facilities. The financial status of the E-UWS is good, and the necessary budget is expected to be secured.

[Finance of the Ministry of Water and Environment]

Figure 12 shows annual budget and expenditure of the Ministry of Water and Environment. Figure 13 shows that the recurrent budget of the Ministry consists of government funds, while its development budget consists of government funds and foreign aid. The Ministry explains that in FY 2019-20, the Ministry's budget was significantly reduced due to prioritization of the national budget for the response to Covid-19. Although the budget amount has been increased to pre-Covid levels, allocations have been limited or delayed due to the government's tendency to limit public spending in the country. According to the Ministry, the reduction in expenditure in FY 2022-23 from the previous year was due to delays in budget allocations from the central government. Unspent budget is carried over to the next fiscal year.

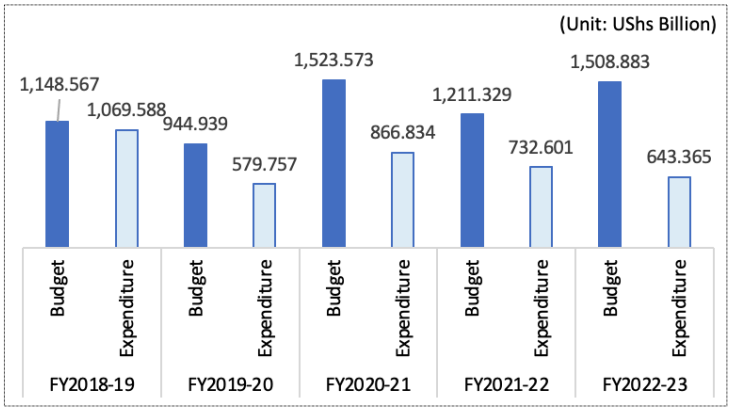


**Figure 12: Annual Budget and Expenditure of the Ministry of Water and Environment**

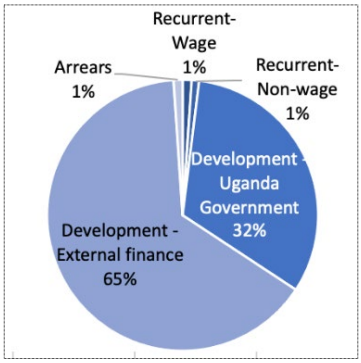


**Figure 13: Budget Breakdown of the Ministry of Water and Environment for FY 2022-23**

Source: Annual Budget Performance Report, Ministry of Finance, Planning and Economic Development, Uganda. Expenditure for FY 2022-23 was provided by the Ministry of Water and Environment.

[41] This is the same for water supply systems in Japan. When the population served by water supply falls below 50,000, business operations are often not viable by revenue of water supply alone, and the ratio of subsidies increases (*Current Status and Issues of Japan's Water Utilities*, Development Bank of Japan Inc. (p.31)).

[42] At the time of the transfer to the E-UWS, 5 RGCs that did not have solar power generation facilities and were using commercial power (see Table 1) were in arrears on their electricity bills. This may be due to their inability to adequately collect water charges.

Thus, although the amount of expenditure for the Ministry of Water and Environment has been declining in recent years, no particular problems are anticipated with the operation and maintenance of the project's facilities, since major repairs and staffing have been completed, no large expenditure is planned, increased revenue is expected from increased water supply, and personnel costs are secured. Based on the above, there are no financial issues that are expected to hinder the sustainability of the project.

### 3.4.5 Environmental and Social Aspect

It was planned to monitor the impact of pumping by the project's facilities on the surrounding groundwater level. E-UWS has been monitoring the amount of pumping from the project's facilities and has confirmed that the pumping is less than planned, and that there have been no problems, such as a drop in water levels, raised by users of nearby wells with hand pumps. If any issues are raised, the relationship with the project's pumping will be investigated and necessary measures will be taken. The pumps are quiet when in use, and the facilities are not a source of air pollution. As mentioned above, the project has been monitored for its impact on the surrounding groundwater, which was planned in terms of environmental and social considerations, and no issues have been observed.

### 3.4.6 Preventative Measures to Risks

E-UWS has implemented an online system for paying water bills and supports mobile money payments, which are becoming widely used in the country. This enables efficient billing and fee collections, even if the number of consumers increases in the future. As mentioned in the Effectiveness section, measures have been promptly taken to address water quality issues, and improvements are expected. Short-term and long-term measures are also planned to be implemented. No other risks that could hinder the continuation of the project effectiveness are identified. In this way, precautionary measures have been taken against possible risks, and no problems have been identified.

### 3.4.7 Status of Operation and Maintenance

[Major facility repairs and expansions carried out to date]

Table 7 shows the repairs and improvements made by E-UWS during the transfer. At the time of the post-evaluation, all repairs had been completed.

**Table 7: Facility Repairs Carried out by E-UWS during the Transfer**

| Repair and Improvement | RGCs |
|---|---|
| Replacement of components and reconstruction of control panel[43] | Lambala, Naigobya, Kyanvuma, Kasassira, Kapala, Kidetok |
| Replacement of pumps and installation of inverters[44] | Lambala, Buseta |
| Replacement and installation of motors | Kapala, Kidetok |
| Connection of commercial power to the pumping stations | Lambala |
| Installation and replacement of consumer water meters | Kasassira, Kameke |
| Replacement of riser main pipe from galvanized iron to uPVC[45] | Kidetok |
| Repair of transmission cable leakages | Kidetok |

Source: Prepared by the evaluator based on the materials provided by E-UWS, and site inspections.
Note: At the time of the transfer, there was no need for repairs to the main facilities in Nambale.

[Utilization status of water supply facilities and future expansion plans]

As detailed in the section of Effectiveness, the water supply facilities developed under the project are generally in continuous use. A total of 661 new house connections have been installed, with more to come. All water intake, transmission, and distribution facilities are in use, except for the solar power generation facility in Lambala. As noted above, this facility in Lambala is not in use due to a failure of the transmission cable connecting the facility to the pumps, but the E-UWS has plans to repair it and resume use of the facility.

The following expansions and additions to the project's facilities are planned for the future. Funds from the E-UWS and the Ministry of Water and Environment will be used to implement these, and support from the JICA Uganda office is also planned.

- Extension of distribution lines: It is planned to extend distribution lines in all RGCs by responding to the requests for house connections in the vicinity of the water supply area of the project. This has been done in Kasassira and Kidetok and is being done in Kapala. Once the distribution lines are extended, the effect of the project will be extended geographically.
- House Connections: E-UWS is getting many requests for house connections, and they will respond to them in due course. At the time of the ex-post evaluation, there were 261 households that had signed up during the campaign[46] to promote new connections which had been conducted by the Ministry of Water and Environment and were in the process of being connected. A total of 542 households planned to sign up once distribution lines are

[43] "Reconstruction of control panel" means to remove some components and install new components to improve performance and functionality.
[44] E-UWS replaced the DC pumps installed by the project with AC pumps and installed inverters so that they can run on solar power. This was done as DC pumps are difficult to obtain in Uganda, and they cannot be replaced in the future. AC pumps can also be used in the future when commercial power is used as an alternative.
[45] The riser main pipe installed by the project was made of galvanized iron, which is very heavy and required a crane when it needed to be lifted for inspection or replacement. E-UWS was concerned that it would be an obstacle for maintenance, and therefore replaced it with a uPVC pipe (unplasticized polyvinyl chloride pipe).
[46] See footnote 27 for more details on the campaign.

extended, according to information from E-UWS. The need for house connections increased rapidly because the project area, the RGCs, had been urbanised with a rapidly growing population, although the project was implemented as a rural water supply project.

- Installation of solar power generation facilities: Kapala and Kidetok have particularly large fluctuations in commercial power voltage. Currently, pumps are not operated when there are large fluctuations, but this will become inconvenient when water demand increases in the future. Therefore, the E-UWS plans to construct solar power generation facilities at these RGCs as a supplementary power source.

No issues have been observed in the policy/system, institutional/organizational, technical, financial, and environmental and social aspects, including the current status of operation and maintenance. Future risks have been well mitigated. Therefore, sustainability of the project effects is very high.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

This project was implemented to improve water supply conditions in nine RGCs in the five districts of the Lake Kyoga Basin in Uganda by constructing piped water supply facilities, thereby contributing to the improvement of living environment.

At both the planning and ex-post evaluation of the project, the provision of safe water and improvement of water supply conditions were priorities for Uganda. The objectives of the project were consistent with the country's development policy and sectoral strategy. The RGCs selected for the project had a relatively low coverage ratio of water supply, high population density, and a significant need for piped water supply facilities. At the time of the ex-post evaluation, the project facilities were still considered important for water supply services in the project area. The project was consistent with Japan's ODA policy at the time of planning. Interconnection with another JICA project was planned and implemented and contributed to the efficient implementation of this project. Synergies and interconnections with other donors' projects were neither planned nor realized. Therefore, the appropriateness and consistency of the project are high.

Through this project, piped water supply facilities for intake, distribution, and water supply, and pipelines were constructed in nine RGCs as planned. The technical guidance (soft component) for building consensus among residents on the use of water supply facilities and for operation and maintenance was also implemented as planned. The project cost and period were within the plan. The efficiency of the project is therefore very high.

The actual volume of water supplies by the project was much lower than the target, and the effects of the project were created only to a certain extent compared to the plan. However, this was due to a delay in the Ministry of Water and Environment providing support to re-establish

the operation and maintenance structure of the facilities, because of the Covid-19 pandemic. The turbidity, which was set as an indicator to measure the effect of the project on water quality improvement, is below the standard values in all RGCs, and achieved the target. Although a reduction in waterborne diseases could not be confirmed due to lack of data, the expected impact has been created such as reducing the burden of fetching water and an improvement in living conditions. From this, the effectiveness and impact are moderately low.

There are no problems with the operation and maintenance of the project facilities in terms of related policies and systems. On completion of the project, responsibility for operation and maintenance rested with the WSSB, but this was transferred to the E-UWS in September 2022. There is no problem with E-UWS in terms of organizational, institutional, technical, and financial aspects, and sustainability is ensured. In addition, precautionary measures are being taken regarding environmental and social considerations and risks. The sustainability of the effects of the project is very high.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Executing Agency

(1) Monitoring on status of operation of the facilities, and achievement of the target of water supply volume and reporting to JICA.

The water supply volume is below the target because the project facilities were not fully utilized for approximately three years after completion of the project, because the facilities failed, and the residents were using alternative water sources. At the time of the ex-post evaluation, the facilities were in operation at all RGCs, and water supply volume was increasing. It is advisable for the Ministry of Water and Environment and E-UWS to continuously ensure that the water supply facilities in all RGCs are fully functioning, that the water quality is good, the target of water supply volume will be achieved in the coming years, and to report the status to JICA regularly.

(2) Regular water quality testing and implementation of measures to prevent contamination.

Water quality testing for the facilities of the project was not conducted for three years after completion of the project, until the transfer to E-UWS. E. coli was detected in 6 RGCs when testing was conducted in September 2023 after the transfer to E-UWS. E-UWS promptly implemented countermeasures and inspections, and there was an improvement in the testing conducted in November - December 2023. It is necessary for E-UWS to ensure that planned measures are taken, such as investigating the circumstances and causes of contamination, disinfecting the water by regularly applying chlorine, and conducting water quality testing once every three months, since there is still a possibility that such problems may occur in the future.

### 4.2.2 Recommendations to JICA

(1) Monitoring of facility operation and achievement of the targets for water supply volume and water quality

As mentioned above, the water supply volume of the project facilities was below the target at the time of the ex-post evaluation. Declining water quality has also been reported. It is recommended that JICA receive reports from the E-UWS regularly on facility operation, target achievement of water supply volume, and water quality, and provide necessary advice.

## 4.3 Lessons Learned

(1) Targets for water supply volume should be set with due consideration of the local environment and cultural factors.

The project facilities were designed so that all residents within the water supply area could have access to water from the project facilities. This is appropriate from the perspective of equitable distribution of project effects and social inclusion of the socially vulnerable and is not problematic. However, the target value of water supply volume, which is an indicator of effectiveness, was set assuming that the entire population would use water from the project facilities 3 years after the project's completion, which was an excessive estimate. The household survey conducted during the ex-post evaluation showed that there are water sources in the water supply area, that are cheaper than the water supply facilities installed in the project, and that a certain number of residents continue to use these sources, even if it takes more time and effort. According to E-UWS, it would take 10 to 15 years for residents to change their lifestyles.

Therefore, it is necessary to realistically estimate the demand in the target year and set a target value, when using water supply volume as an indicator for rural water supply projects, and to consider the local environment and cultural and economic factors, such as the availability of alternative water sources, willingness of pay of the residents, and the period required for lifestyle changes.

(2) Consider adding alternative power source if the primary power supply is unreliable.

There are large fluctuations in commercial power voltage in some target areas of the project - Kapala and Kidetok. Automatic voltage regulators were installed but were not effective enough due to the very large fluctuations. As a result, the electrical facility was overloaded, the inverter was damaged, and the water supply was suspended for a long time. Thus, it is advisable to consider installing an alternative power source alongside if the main power supply is unreliable, so that water supply is not suspended due to unreliability of the main power supply.

(3) The length of transmission cable connecting solar power generation facility and pumping station should be as short as possible.

The underground power cable connecting the solar power generation facility to the pumping station was damaged, and the water supply was disrupted, in Nambale, one of the project areas. The solar power generation facility in Nambale was built in a school yard, which is highly visible to the public, to reduce the risk of theft of the solar panels. As a result, the facility, and the pumping station where the water source is located are far apart, and the transmission cable is long. Such a long transmission cable has a relatively high risk of failure along the way. For example, the transmission cable can be accidentally disconnected during road construction, and electricity can leak from the cable due to a poor environment where the cable is buried. It is advisable to consider both the risk of theft, and the increased risk of damage with a long transmission cable, when constructing solar power generation facilities for rural water projects, and to locate the facilities in appropriate places.

(4) The grant recipient government to develop plans and targets for promotion of house connections.

It was expected that the Ministry of Water and Environment would implement house connections using the water supply facilities developed under the project after project completion. The Ministry explained that it had planned to start this immediately after the project was completed, although the target number of connections and timing of implementation were not stated in the project planning documents. However, this was delayed for about two years, and was one of the reasons why the water supply volume of the project facilities was less than the target at the time of the ex-post evaluation. The main reasons for the delay were restrictions on the movement of Ministry staff and budget cuts due to the Covid-19 pandemic. To prevent possible delays in the start of house connections due to such unexpected circumstances, and to make effective use of the water supply facilities developed by the project, the following measures can be taken in similar projects in the future when, as in this project, the installation of house connections is expected shortly after the completion of the project:

(a) The executing agency should develop plans and targets for house connections at the time of planning the JICA project to ensure that house connections can be implemented after completion of the project, and secure the budget required to implement the plans and achieve the targets, with the agreement of JICA. JICA shall monitor and provide necessary advice on securing the budget.

(b) Make the house connections an obligation of the executing agency in the JICA project and set a target value. The executing agency can start the house connections at locations where water supply facilities have been installed by the project. Relevant parties should agree on the conditions in a memorandum of understanding, so the house connection works would

not affect or confuse the liability of the contractor of the project. It is also worth considering the project providing materials and equipment, such as pipes and water meters, to facilitate the house connections.

## 5. Non-Score Criteria

### 5.1 Performance

#### 5.1.1 Objective Perspective

None.

#### 5.1.2 Additionality

None.

(End)