Umbrella Authorities 2020

Data on Operational Performance, Financial Viability and the Impact of Covid-19

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Collection and Analysis of Utility Performance Benchmarks for the Uganda Umbrella Authorities

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ACRONYMS AND ABBREVIATIONS

DP	Development Partner
HR	Human Resource
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IWA	International Water Association
IWMDP	Integrated Water Management and Development Project
KfW	KfW Development Bank (Germany)
KPI	Key Performance Indicator
MWE	Ministry of Water and Environment
NRW	Non-Revenue Water
NWSC	National Water and Sewerage Corporation
PSP	Public Standpost
PST	Project Support Team
SCAP100	100% Service Coverage Acceleration Project
UA	Umbrella Authority
UPMIS	Utility Performance Monitoring and Information System
USAID	United States Agency for International Development
USHA	Uganda Sanitation for Health Activitiy
VAT	Value-Added Tax
WSDF	Water and Sanitation Development Facility
WSUP	Water and Sanitation for the Urban Poor (project)
WURD	Water Utility Regulation Department (MWE)

EXECUTIVE SUMMARY

The six regional Umbrellas of Water and Sanitation, or Umbrella Authorities (UAs), are providing piped water supply services in a large number of small towns and rural growth centres across Uganda. This report analyses their operational performance and financial viability during the year 2020 (January to December)[1]. An additional focus of the analysis is the impact of the Covid-19 pandemic on the UAs' operations.

The assignment is a contribution to the Integrated Water Management and Development Project (IWMDP), which is being implemented by the Ministry of Water and Environment (MWE) and the National Water and Sewerage Corporation (NWSC) with a credit from the World Bank. Support to the UAs under this project will include institutional professionalization (through consultancy support) as well as physical improvements (procurement of materials to increase the number of people served and improve the revenue base). The findings presented in this report will provide baseline information for planning these activities and for monitoring progress through the IWMDP results framework. Beyond this immediate purpose, the assignment was also understood as a step towards developing a general monitoring and benchmarking framework for the UAs, in order to keep the MWE, its development partners and other stakeholders informed on a continuous basis.

The figures presented in this report are based on a comprehensive analysis of data from the UA's billing and payment system, the online Utility Performance Monitoring and Information System (UPMIS), and complementary information provided by the UAs' management and accountants.

OPERATIONAL PERFORMANCE

At the end of December 2020, the six UAs were directly managing **259 piped water schemes**, of which 37 had been taken over during the year 2020. The UAs are also gazetted as Water Authorities for 213 other schemes, which are currently still under local government or community management and will be taken over during the coming years. In 2020 the UAs have also taken over a number of **refugee schemes** (i.e. schemes constructed by humanitarian organisations to supply refugee settlements) for permanent management. If this is successful many more such schemes may follow.
-> Section 2.1

In addition to piped water supply services, the Central and the Northern Umbrella are managing several **faecal sludge treatment facilities** and are offering limited cesspool emptying services. However, these activities still account for less than 0.5% of the revenue and expenditure of the two UAs. Details on the faecal sludge management activities were not available for this study.

The **number of people served** by the UAs is difficult to estimate, because the service areas are not well defined and not all people within the service areas are actually served. The best estimates are 2.4 million people living in the service areas[2], and 0.96 million people actually served (the latter figure being estimated from consumption). This is equivalent to a current service coverage of about 40%. Both network expansion and increased production capacity will be needed to serve the entire population of the service areas. Currently, about 78% of the people are served by individual connections (in most cases yard taps) and 22% by public water points.
-> Section 2.2

[1] The calendar year 2020, from January to December, was chosen as the financial year 2020/21 is not yet complete whereas analysing data for the financial year 2019/20 would produce outdated results.
[2] Service areas of the schemes that are currently effectively managed by the UAs only.

The **infrastructure managed by the UAs** has an average age of 11 years. The total installed production capacity is approximately 51,500 m³ per day, of which about one third is being used. There is hence room to connect many more people without expanding the production capacity. On the other hand, there are also many schemes that have reached or exceeded their design capacity. There are significant differences between the UAs regarding the technologies used: The Central UA uses grid power for about 90% of its water production. In Karamoja, 75% of the pumping is done using solar energy. In the South-West, 93% of the water production is based on gravity flow schemes. There are very few schemes left that use diesel generators as main source of energy.
-> Section 2.3

The total **number of active connections** of all schemes managed by the UAs was about 60,000 in December 2020, including 2,100 public water points. 98% of the connections are metered and all billing is done by consumption, with very few exceptions. Only Mid-Western UA is operating a few gravity flow schemes hat are still (partially) unmetered. Most of the schemes managed by the UAs are small, with an average number of connections per scheme of 230. There are only five UA schemes with more than 1,000 connections. The numbers of customers are distributed very unevenly: The Central UA alone accounts for almost one third of all connections of the UA schemes and has almost ten times more customers than the Karamoja UA.
-> Section 2.4

Service quality and reliability is not yet well monitored. A reasonably reliable indicator is the continuity of supply, which ranges from 90% to 96%. The indicator represents the percentage of time (in days) during which water services were available in the UAs' schemes, on average. It does not capture the fact that more than a quarter of the customers have less than 24 hours water supply per day, even if the system is functional. When systems are "down" this is typically due to failures of the pumping system, problems with the transmission or distribution mains (e. g. due to landslides or roadworks), or reservoir leakages/repairs. The are no reliable data on the numbers of **customer complaints**, as complaints are mostly handled at the scheme level, where most water offices have complaints books. Complaints are not analysed systematically, there is no software to handle complaints and no evidence of closure of complaints.
-> Section 2.5

All UAs have **water quality** testing programmes, with a good coverage of the schemes managed by the UA (usually one sampling day per scheme per quarter). Unfortunately, not all the existing analysis data were available for this study[3]. According to the information available, the compliance with micro-biological standards (i. e. absence of e. coli in the sample) was between 80% and 98% of the samples, with the higher figure being less reliable. Of the non-complying samples many show very low counts of e. coli, which needs further investigation (including of the sampling and analysis methods). Non-compliance with phys.-chemical water quality standards is in most cases related to low pH or high iron contents, which are not a health concern. However, the Mid-Western UA is operating several schemes that are using surface water (from mountain streams) without any treatment. With seasonally high turbidity and micro-biological contamination these schemes obviously don't comply with water quality standards. In general, it is strongly recommended to expand **chlorination** in the water schemes. Currently more than 70% of the schemes don't do any water treatment.
-> Section 2.6

[3] In several UAs, the existing analysis data were not or only partially uploaded to UPMIS. It was not possible, for this report, to collect, process and analyse raw water sampling data from the original records.

Non-revenue water (NRW), the difference between water produced and water sold (billed) to the customers expressed as a percentage of water produced, varies from 27% to 39% with an average of 36% across the six UAs. These figures are without the very large Nyarwodho scheme (Northern UA) which has to be analysed separately[4]. There is urgent need for a comprehensive NRW reduction programmes for all UAs.
-> Section 2.7

Consumption: The total volume of water sold (billed) by the UAs was 3.49 million m³ in 2002, according to the billing data. This is equivalent to an average monthly consumption of 4.9 m³ per active connection. 79% of the water was sold to private domestic customers, 11% through public water points, 8% to institutions such as schools and health centres, and only 2% to commercial customers[5].
-> Section 2.8

The total **staffing** of all UAs, including the local scheme operator staff, is about 1,213, ranging from 36 in Karamoja to more than 400 in the Central region. Of these, 116 are working at the regional UA headquarters (including support staff) and the rest at the scheme level. The overall staffing is equivalent to an average of 20 staff per 1000 connections. While this seems high by international standards, it should be noted that this is for the operation of a large number of small schemes, with an average of only 230 connections per scheme. Staff at the scheme level are not employees of the UA, with the exception of Mid-Western UA and partly Northern UA. The other UAs have management contracts with the scheme operators, who receive a provision of typically 40% of the revenue collections for their services. Recruitment of key staff is done through the Ministry's HR department, following public sector systems. Scheme operator staff is recruited locally by the UA management.
-> Section 2.9

FINANCIAL VIABILITY

Tariffs are set individually for each scheme and were inherited by the UAs at the time of takeover. To the extent possible (acceptable to stakeholders), the UAs aim to adjust them to cost coverage levels and harmonise them by type of schemes (i.e. using grid power, solar power, or gravity flow schemes). Within the same scheme, user tariffs are the same for all types of customers (excluding public water points). Tariffs per unit are independent from the volume of water consumed[6]. The average tariff, across all schemes of all UAs, was 2,565 UGX, plus VAT and a monthly service fee of 1,500 UGX. This is equivalent to a monthly water bill of 10,850 UGX for a household consuming 3 m³ (that is, 20 litres per capita per day for a 5-people household). The highest tariff charged in UA schemes is 3,400 UGX per m³ (plus VAT and service fee), just below the NWSC domestic tariff of 3,516 UGX.

The tariffs to be paid by the attendants (water vendors) of **public water points** are lower than the standard tariff. Nevertheless, the usual price to be paid by customers is 100 UGX per jerrycan, which is equivalent to 5,000 UGX per m³. This is higher than the standard water tariff for private connections in any of the UA schemes. It is hence problematic to consider public water points as pro-

[4] According to the incomplete data available, Nyarwodho had 78% NRW in 2020. As Nyarwodho accounts for 41% of the total water production of the Northern UA, this would cause the average NRW for Northern UA to rise from 38% to 55%, and the average NRW of all UAs from 36% to 40%. However, the reliability of the Nyarwodho data has to be validated by a special investigation.
[5] There may be cases, however, where institutions or small businesses are registered as private domestic connections in the billing system (where the tariff applied is the same for all types of customers).
[6] There were no block tariffs in 2020, but this will be piloted in 2021.

poor facilities. There are policies to reduce the tariff to 50 UGX per jerrycan but in practice this is rarely achieved, because of the need to remunerate the public standpost attendants.

Connection fees are to some extent variable and also depend on the availability of funds for offering promotional (subsidised) connections. The fees charged for a new connection usually range from 100,000 to 300,000 UGX, compared to full costs of about 300,000 to 450,000 UGX. As most customers are not able or ready to pay the full costs, increasing the number of customers depends strongly on the availability of funds to subsidise connection fees.
-> Section 3.1

Revenue collections are rising, with an increase of 23%[7] during the year 2020, despite the negative impact of Covid-19. A positive trend was observed for each of the UAs, with the highest rates of improvement reported for the smallest UAs (Karamoja: +61%, South West: +39%). The total amount billed by the UAs in 2020 was UGX 10.5 bn (excl. VAT)[8], of which 8.6 bn[9] were actually collected. Revenue is very unevenly distributed between the UAs: The Central UA's revenue (UGX 328m per month in 2020) is more than fifteen times higher than the Karamoja UA's.

The average **collection efficiency** (amount collected divided by amount billed) was 83% but would have been about 88% without the impact of Covid-19. The collection efficiency in Karamoja is still significantly lower than in other regions with 56% (66% without the effect of Covid-19).
-> Section 3.2

The total running **operation & maintenance costs** of the UAs amount to UGX 10.2 bn, excluding any infrastructure investments. On average, about one third of these costs are incurred at the regional level (UA headquarter staff and operations) and two thirds at the scheme level. About 50% of the total are staff costs, 20% energy costs and 30% other costs including office running, transport, chemicals, minor repairs and routine maintenance. However, there are considerable differences regarding the cost structures of the individual UAs. The two small UAs spend more than 50% (Karamoja even 73%) of the total O&M costs at the regional level, because a minimum of overhead costs is unavoidable even if the customer base is small. The larger UAs are benefitting from economies of scale. The share of energy costs varies in a wide range depending on the technology mix, as they are lower in UAs with high percentages of solar and gravity flow schemes.
-> Section 3.3

Cost recovery: In 2020, the UAs were able to cover 84% the total running O&M costs by revenue collections from customers. Without the negative impact of Covid-19, cost coverage would have reached around 90%. The running O&M costs include staff, energy and other costs including minor repairs and routine maintenance, both at the regional and at the scheme level. A value above 100% indicates that the UA is able to cover part of the capital maintenance costs, such as major repairs and replacement of equipment or assets.

The differences between the UAs are significant. In 2020…

- Central UA reached a cost coverage of 107% (would have been 112% without Covid-19).
- Mid-Western UA reached 90% and can be expected to break even soon in a normal year.
- Eastern and Northern UAs covered 83% and 78%, respectively, of the running O&M costs and would have reached 85% to 90% without the impact of Covid-19. They can be expected to break even within the next few years.

[7] Calculated by comparing the last quarter of 2019 (Oct-Dec 2019) to the last quarter of 2020 (Oct-Dec 2020).
[8] 9.7 bn (93%) through the Pegasus billing and payment system, the rest coming from sources of revenue that are not captured by the system (pre-paid systems, direct payments to bank accounts, connection fees etc.)
[9] 8.1 bn (excl. VAT) through the Pegasus system. The total amount paid through the system was 9.5 bn incl. VAT.

- The South-Western and Karamoja UAs currently have a too small customer and revenue base to bear the overhead costs of their regional headquarters, which represent more than 50% of their total O&M costs. Operational subsidies will continue to be required in the medium term.

All UAs, including Karamoja, were able to recover the direct O&M costs incurred at the scheme level, i.e. the remuneration of scheme operators, pumping costs and other local O&M costs.

Note that all these figures are based on preliminary analyses of revenue vs. costs. The UAs are currently not preparing audited financial statements such as balance sheets.

The total operational deficit of the five UAs that are not yet breaking even was UGX 1.9 bn in 2020. This was covered and far exceeded by **subsidies**, which reached a total amount of UGX 16.5 bn in 2020. This unusually high amount allowed to make significant infrastructure investments (see below). The main sources of subsidies were the government project known as SCAP100 (UGX 9.2 bn), conditional grants (UGX 2.5 bn) and other government support (UGX 3.5 bn, salaries and materials supplied in kind). The Mid-Western and Northern UAs also had some donor support (UGX 1.4 bn).
-> Section 3.4

Investments, understood here as all expenses to improve, expand or replace the UAs' assets, amounted to about UGX 8.9 bn[10] in 2020. These included network extensions and new connections as well as capacity increases and replacement of equipment. In total, 442 km of new pipelines were laid and 145 km of existing pipelines (3% of the total network) were renewed. The rate of investment in the UAs' infrastructure was hence satisfactory in 2020, mainly due to the generous disbursement of funds from the SCAP100 project. Some UAs, in particular Mid-Western through the WSUP project, benefit from additional investments directly paid by the donor (not through the UA accounts), which are not included in the above figures. All investments are grant funded. The UAs currently do not handle any government or commercial loans.
-> Section 3.5

Currently there is **no system for asset valuation and depreciation** in place. All infrastructure managed by the UAs is considered as government property, which the UA (as Water Authority) receives in trust for operation and service provision, but without formally owning the assets.

A summary of **conclusions and strategic considerations** is presented at the end of the chapter on financial viability. To avoid repetition please refer to
-> Section 0.

Impact of Covid-19

In general, the UAs were able to maintain water supply services without major restrictions. There was no significant reduction of the amounts of water consumed and billed during the lockdown period, which began on 31st of March 2020 and was gradually eased starting from May 2020.

However, the political guidance that payment of utility bills should not be enforced during the lockdown period resulted in a substantial reduction of revenue collections during the lockdown months. In most cases the arrears accumulated during this period could not be recovered after the end of the lockdown, and no government payments were received to compensate for the losses.

To quantify the revenue losses due to Covid-19, the monthly billing and collection data were analysed for each UA, from 9 months before the lockdown until 7 months after the end of most of

[10] Estimate exclusive of VAT for supplies and services that are subject to VAT. The fact that this is lower than the amount of subsidies received can be partially explained by the fact that a large part of the SCAP100 funding was only disbursed during the last months of 2020.

the restrictions. The method used was to calculate “normal” collection efficiency from the months before and after the lockdown, and use this normal collection efficiency to calculate the collections that could have been expected without the impact of Covid-19. The difference between the actual collections and the calculated collections represents the estimated revenue loss due to Covid-19.

In April 2020, when a strict lockdown was in place during the entire month, revenue collections were about 40% to 50% lower than they would have been with normal collection efficiency (average for the six UAs: -42%). In May the impact decreased in most regions and in June the collections were almost back to normal, except in Karamoja where recovery took longer.

The immediate impact of the lockdown hence ended after about three months. Revenue collections recovered quickly as the lockdown restrictions were being eased.

The overall impact on the UAs’ annual revenue was therefore limited. The annual collections were between 4% and 10% lower than they would have been without Covid-19, with an average of 6%. In absolute numbers, this is equivalent to a total loss of UGX 564 million for all UAs.

However, these figures only reflect the direct impact of the lockdown period on collections. Other longer-term effects (e.g. due to a general economic slowdown) or possible increases of O&M costs, for example due to reduced staff productivity, are not captured in this analysis.

1 INTRODUCTION

1.1 BACKGROUND OF THE ASSIGNMENT

This report and the underlying data were prepared through a short-term assignment under the Integrated Water Management and Development Project (IWMDP), implemented by the Ministry of Water and Environment (MWE) and the National Water and Sewerage Corporation (NWSC) with a credit from the World Bank.

Under one of its subcomponents – Support to Small Towns and Rural Growth Centers – the IWMDP will strengthen the capacities of five of the six[11] regional Umbrellas of Water and Sanitation, or Umbrella Authorities (UAs), in the areas of operational and financial management. The support will furthermore include physical improvements, essentially by providing materials (pipes, fittings and water meters) to increase the number of people served and improve the revenue base. Procurement of bulk water meters will allow to monitor non-revenue water in the schemes that do not have functional production meters.

The data presented in this report will provide baseline information for implementing these activities and for monitoring progress under the IWMDP results framework.

1.2 BRIEF ON UMBRELLA AUTHORITIES

Since August 2017, the MWE has introduced a new management model for piped water systems supplying small towns and rural growth centres, i.e. all supply areas that are not served by the National Water and Sewerage Corporation (NWSC), in order to improve and professionalize service delivery.

Under the new Umbrella management model, the six regional Umbrellas of Water and Sanitation are gradually taking over direct management responsibility for most or all the piped water schemes within their respective region. For more than 430 schemes, the Umbrellas were formally gazetted as Water Authorities and are therefore now referred to as Umbrella Authorities (UAs). This is a shift from the Umbrellas' previous role as providers of O&M backup support while the schemes were being managed by local authorities or communities.

In the schemes they have taken over so far – more than 260 at the time of writing –, the UAs operate as public water utilities and are directly responsible for the technical and financial operations. They contract or employ the local scheme operators and have introduced an online billing and payment system known as the Pegasus system.

This has led to encouraging progress in service quality and in particular revenue collection. However, the UAs still need substantial support to achieve full professionalization, cost recovery and consolidation of the internal procedures. For example, financial management is still manual and based on public sector accounting standards but needs to be upgraded to meet the requirements of a water utility. Other examples are the introduction of systematic asset management, human resource management and training programmes.

Last but not least, substantial funds are needed to make the necessary investments. The UAs are often taking over unmetered schemes in need for rehabilitation or capacity increases. Funds are also

[11] Central, Eastern, Mid-Western, Northern and South-Western UA. However, for consistency this report also covers the sixth UA, the Karamoja UA.

needed to offer subsidised connections in order to increase the customer base. Such investments cannot be met from the UAs' running revenue collections, as will be shown in this report.

The professionalization support under the IWMDP will address some of the above-mentioned capacity building issues. It is hoped that the data and findings in this report will help to formulate strategies and prioritize activities.

1.3 Objectives of the Consultancy Assignment

The Bank team and the MWE see performance monitoring of the UAs as an important tool not only to provide baseline and monitoring information to the ongoing IWMDP project, but also to inform a range of stakeholders and Development Partners (DPs) about the UAs' performance, at national and international levels. It is expected that the availability of local performance benchmarking information will improve monitoring, highlight concerns and constraints, inform the MWE's Water Utility Regulation Department (WURD), and ultimately improve service delivery and sustainability.

With this assignment, the Bank team is setting steps towards developing a UA monitoring system and reduce the barriers that make comparisons difficult, through a standard set of meaningful indicators.

In light of the development of the Covid-19 pandemic in 2020, an additional interest of the assignment is to assess and quantify the impact of Covid-19, in particular the lockdown in 2020, on the UAs' operations and financial situation.

The scope of the consultancy was hence

- to collect monthly financial data for all six UAs up to December 2020, in order to monitor financial performance of UAs under the COVID-19 pandemic;
- to collect data on the annual technical and financial performance of the UAs;
- to provide baseline information for the activities under the IWMDP, in line with the IWMDP results framework;
- to develop formats, performance monitoring data and indicators in view of developing a performance monitoring and management tool for key stakeholders including the IWMDP Project Support Team (PST), MWE, UA management and Development Partners.

1.4 Methodology and Data Sources

The data and conclusions in this report are based on a comprehensive analysis of all data available through the UAs' online billing and monitoring systems, complemented by information obtained directly from the UAs' management and accountants. The assignment did not include field visits to the UAs, but the consultant is familiar with the situation on the ground due to his earlier position as Operation & Maintenance Advisor at the MWE[12].

The period chosen for the analyses is the calendar year 2020 (January to December). While the standard reporting period in Uganda is the financial year (July to June), the financial year 2020/21 is not yet complete whereas analysing data for the financial year 2019/20 would have produced outdated results.

[12] Technical Advisor, November 2014 to December 2018

The main sources of data were:

- The UAs' online billing and payment system, known as the **Pegasus system**, for monthly data on revenue and water consumption
- The UAs' online **Utility Performance Monitoring and Information System (UPMIS)**, for monthly operational and financial performance data at the scheme level *see http://upmis.geocodis.com/ (login required to access the full information)*
- **Questionnaires filled by the UA Accountants**, with quarterly information on revenue that is not captured by the Pegasus system, subsidies received, O&M costs and investments made.
- Additional questionnaires filled by UA management to provide complementary information that is not available from any of the above sources.
- The UAs quarterly reports[13] and internal performance spreadsheets to fill gaps in UPMIS and cross-check outliers.

Details on the origin, quality and completeness of the data used are given at the beginning of each section of the report.

The selection of the data and indicators was guided by the IBNet toolkit v. 5.81, which was provided by the Bank team. Certain indicators that are in use in UPMIS and the UAs' quarterly reports but not in the IBNET system were calculated additionally.

Operational data were calculated and aggregated from the scheme level. To the extent possible, outliers were verified/corrected and gaps in the available datasets were filled from other sources as well as through telephone calls to clarify doubts. The data provided on connections, water produced, water billed, tariffs, billing revenue and collections are consistent with the scheme level data presented in Annex 1. Gaps filled by estimations are distinguished in italics in the Annex data.

The consultant wishes to thank those who have contributed to data collection and validation, in particular Eng. Herbert Nuwamanya, Ass. Commissioner Support to Utility Management at the MWE; Stephen Nsimbi, Senior Commercial Officer at the MWE; as well as the six UAs' Accountants and Managers. Special thanks also to Mr. Alexander V. Danilenko of the Bank team for continuous guidance and support.

[13] In practice, only the Q2 reports (quarter 2 – October to December 2020) were available and used.

2 OPERATIONAL PERFORMANCE

2.1 NUMBER OF WATER SUPPLY SCHEMES MANAGED BY THE UAS

Data sources & data quality

The numbers of schemes are derived from the number of schemes in the Pegasus billing system that have data for the calendar year 2020, cross-checked against the management information from the Q2 reports.

The data are accurate as of December 2020. Since then more schemes have been taken over, while for others the takeover process is ongoing but not yet completed (see lists at the end of each table in the annex).

The numbers of "gazetted" schemes are from UPMIS, which are in turn based on the lists published in the Uganda Gazette.

Results

Table 2.1 – Number of Water Supply Schemes Managed by the UAs

As of 31 December 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
No. of schemes effectively managed by UA	**65**	**35**	**16**	**56**	**56**	**31**	**259**
… of which taken over in 2020	8	2*	2	12*	11	2	37*
Additional schemes gazetted but not yet managed by UA	41	20	21	11	31	89	213

** 2 schemes were handed over to NWSC in 2020 (Eastern: Upper Sipi; Mid-Western: Rwebisengo)*

Schemes "effectively managed by the UA" are defined here as schemes where (a) the local scheme operator has been contracted by the UA and (b) revenue collection is done by the UA, using the Pegasus billing and payment system. A list of the scheme names is provided in Annex 1.

"Gazetted" schemes are schemes for which the UA has been officially defined as Water Authority, according to the Uganda Gazette.

Of the gazetted schemes, many are being supported or advocacy meetings are being held to prepare them for management by the UA. However, they were not counted as "effectively managed" unless the above criteria were met.

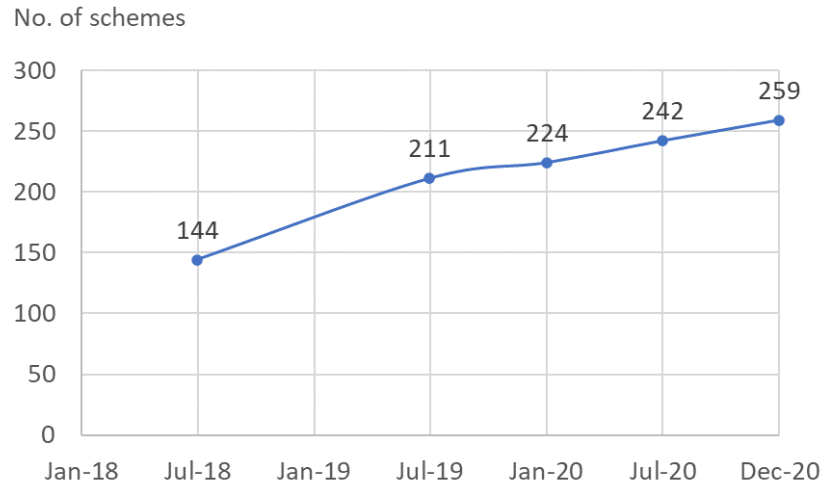


Fig. 2.1 – Number of schemes effectively managed by the UAs

Notes

- The progress of takeovers depends partly on the success of advocacy meetings and partly on the availability of resources. Advocacy is needed to create acceptance among the local leaders and communities regarding management by the UA and in particular payment for water by consumption. Resources are needed for metering of unmetered schemes, for establishing water office and internet infrastructure (introduction of the online billing system) and for urgent repairs.
- In **Karamoja** there are 13 schemes that were gazetted for management by the UA even though they are currently **down (non-functional)** and need substantial rehabilitation before they can be operated by the UA. The Karamoja UA does not have the resources for these rehabilitation works.
- **Refugee schemes**: As of December 2020. the **Northern Umbrella** was operating six schemes serving refugee settlements and host communities: Alere, Ayilo 2, Nyumanzi, Ofua 3, Olujobo-Tika and Omugo 6. Later a seventh scheme – Bidi Bidi Zone 5 – was taken over and many more takeovers are planned.
- The large number of schemes gazetted for the **South Western Umbrella** mostly consist in small, unmetered gravity flow schemes that need substantial investments to be adapted for commercial operations.

Sanitation / Faecal Sludge Management

In addition to the water supply schemes, the Central and the Northern Umbrella are managing several **faecal sludge treatment facilities** and are offering limited cesspool emptying services. The faecal sludge management facilities are located in Kayunga, Kiboga, Nakasongola and Kyotera for Central Umbrella and in Apac and Dzaipi for Northern Umbrella.

Details on these services were not available for this study. They are not yet captured by the UPMIS system.

Other sanitation services are limited to the operation of public toilets in a small number of towns. There are no sewerage systems in any of the towns managed by the UAs.

The UAs also have sanitation and hygiene awareness components as part of their advocacy interventions and as part of the application procedure for new connections to the water supply systems.

2.2 PEOPLE SERVED

Data sources & data quality

Both the number of people living in the service areas and the number of people served are not known accurately.

The service areas supplied by the UA schemes are not defined precisely. The gazettes only list the names of the schemes to be managed but do not define the area to be served by the UAs as Water Authority.

The numbers given below as "**population living in the service area**" are the totals indicated for "population served" for each of the schemes, as given in UPMIS and the UAs' quarterly reports. This is mostly based on local government information or scheme design figures and includes people living in the service area who do not have access to or who are not using piped water.

To estimate the number of **people who are actually served** by the piped water schemes, the per capita consumption (from the Pegasus billing system) was used as a proxy. It was assumed that a person supplied by the piped system will consume at least 10 litres per day. This figure is based on per capita consumption data for four towns, obtained by combining customer mapping surveys with consumption data per connection[14].

The percentage of **people served by public water points** is a rough estimate, assuming that on average 100 people are served by each water kiosk or public standpost. This rather arbitrary assumption lies between the figure used in the Sector Performance Report 2019 (Annex 4) – 150 persons served per public standpost – and the figure obtained from the above-mentioned customer mapping survey – 46. The survey covered only 23 PSPs in two towns (Matale and Namagera). Clearly, a larger sample in more towns and from different regions of Uganda would be needed in order to obtain a more reliable estimate of the average number of PSP users.

[14] The four towns are Kamengo, Matale (both Central Umbrella), Namagera and Irundu (both Eastern Umbrella). Customer mapping was undertaken by the Uganda Sanitation and Hygiene Activity (USHA) in 2020. The survey included a questionnaire where each customer indicated the number of people using the connection. These data were combined with consumption data from the Pegasus billing system. In total 15,153 people were served by 783 connections. The average per capita consumption was 14.0 liters/day for individual connections, 10.7 liters/day for public standposts and 3.3 liters/day for institutions; the latter include many beneficiaries (e.g. in day schools) for whom this is not the main source of water supply. Ultimately, an average of 10 litres per day was used, taking into account the fact that the four surveyed towns are probably slightly above average in terms of population income. The average per capita consumption across Uganda may therefore be somewhat lower than in the four towns.

Results

Table 2.2 – People served

As of December 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Estimated population living in the service area	543,000	372,000	177,000	504,000	464,000	342,000	2.40 million
No. of people served (estimated from consumption)	306,026	163,859	38,499	202,253	141,848	103,614	0.96 million
Service coverage (estimated)	56%	44%	22%	40%	31%	30%	40%
Estimated % of users served by public water points	16%	9%	20%	36%	17%	42%	22%

The above figures refer to the **schemes effectively managed by the UAs only**. Estimating the population for all gazetted schemes was not attempted because data are not available for most of the schemes that are not yet taken over

Interpretation

- Of approximately 2.4 million people living in the service areas of the schemes managed by the UAs, only about 40% are actually using piped water. Partly this is due to poor network coverage, as the existing distribution networks do not cover the entire service area (which is furthermore not defined precisely, as mentioned above). People living within the area covered by the distribution network may also prefer to use other (free) water sources.
- With an estimated service coverage of 40% (average), both network expansion and increased production capacity will be needed to serve the entire population of the service areas. Affordability of connection fees and awareness on safe water are aspects to be considered to reduce the number of people using alternative water sources even though they have access to piped water.
- On average, 78% of the people are served by individual connections (in most cases yard taps) and 22% by public water points.
- The higher percentage of people served by public water points in the South West is plausible, given that most schemes here are gravity flow schemes of the traditional type, whereas there are fewer schemes with an urban character.

2.3 INFRASTRUCTURE CHARACTERISTICS

Data sources & data quality

Data on installed capacities, network length, type and age of schemes are based on UPMIS, with gaps filled from quarterly reports where available. Data quality and completeness are variable.

Installed capacity is one of the monthly variables reported through UPMIS. Data quality was checked against water production. Gaps were filled and obviously wrong data were replaced by estimations from water produced or (for schemes without a bulk water meter) from water consumption. 23% of the scheme data had to be estimated in this way.

Total mains length is also a monthly variable reported through UPMIS. In this case, only 8% of the data were missing and were estimated using average values. Data are for the total mains length (transmission and distribution combined). Separate data for the distribution network are not available.

The **age of the schemes** was determined from the year of construction given in UPMIS. In this case gaps were not filled. Data on the construction year were available for 184 of 259 schemes (71%). The averages given are simple averages without weighting.

Type of scheme refers to the source of energy used for transmission from the water source to the reservoir(s). Data are from UPMÌS with gaps filled from quarterly reports where possible, so that information was available for 92% of all schemes. The results were weighted by the volume of water produced.

Results

Table 2.3 – Infrastructure characteristics

As of December 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Installed capacity [m³ per day]	9,446	12,681	2,381	14,128	9,034	3,832	51,502
System capacity utilization*	53%	21%	23%	22%	35%	37%	31%
Total mains length [km]	1,528	862	237	1,107	814	565	5,113
Average age of the schemes	9 yrs	10 yrs	5 yrs	12 yrs	12 yrs	15 yrs	11 yrs

** Total water production (see section 2.7) as percentage of total installed capacity*

Interpretation

- The figures on system capacity utilization are indicative and should be interpreted with caution. Both the data on installed capacity and on water production include estimates, while the situation is different for each scheme. However, it is safe to state that the majority of the schemes have spare capacities to connect more customers.
- The average age of the schemes managed by the UAs is 11 years. This implies that many of the schemes now need capital maintenance investments to maintain them in good working

conditions. In Karamoja the infrastructure is significantly younger with an average age of only 5 years.

There are significant differences regarding the type of infrastructure being operated by the six UAs, as visualised by the pie charts below. The values given are percent of the total water production by type of energy supply.

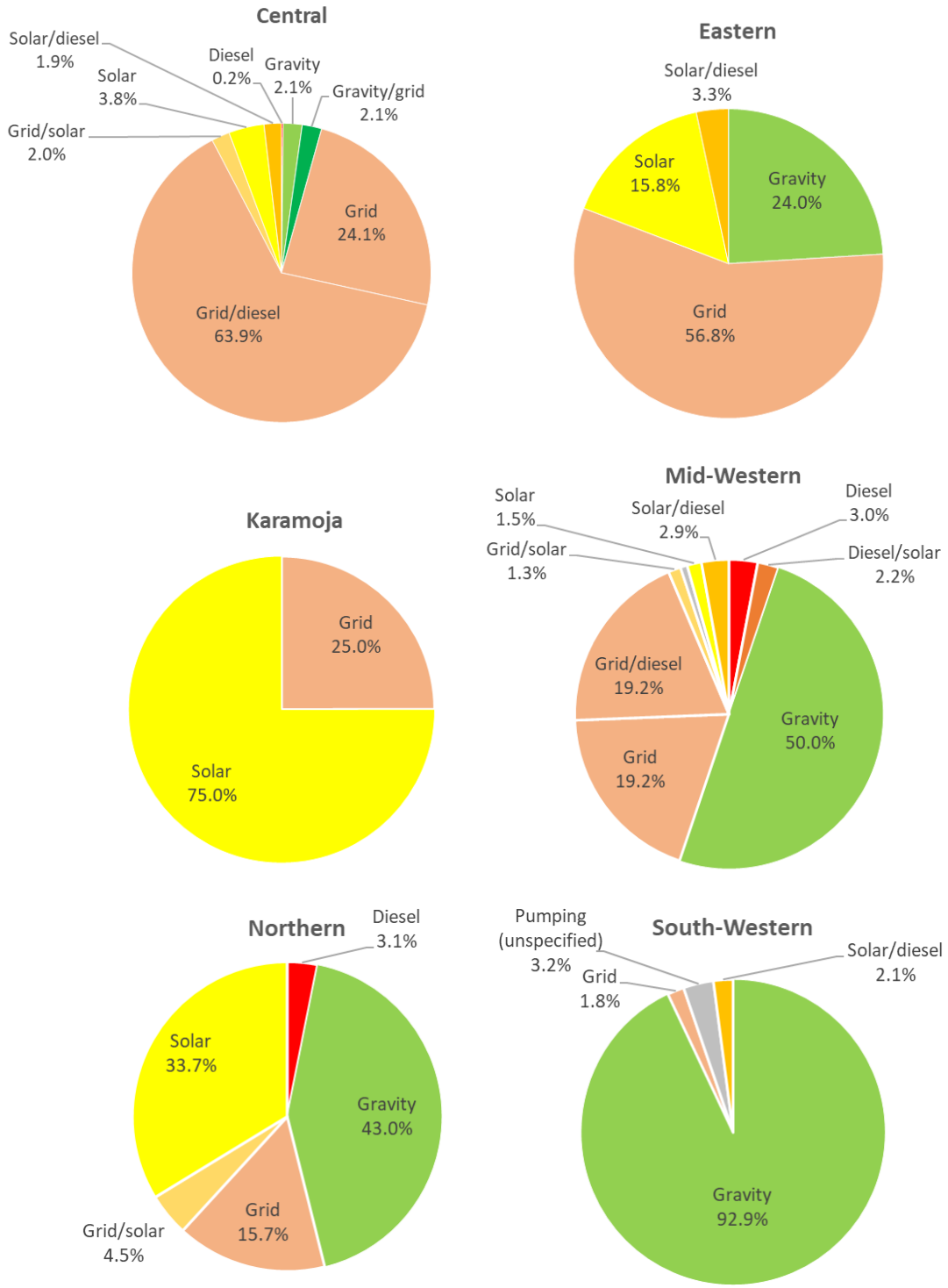


Fig. 2.2 – Types of water supply schemes by source of energy (% of water produced)

- Central UA uses grid power for about 90% of its water production.
- In Karamoja, 75% of the pumping is done using solar energy.
- In the North, solar energy also plays a significant role. The only gravity flow scheme, Nyarwodho, accounts for 43% of the total water production.
- In the South-West, 93% of the water production is based on gravity flow schemes.

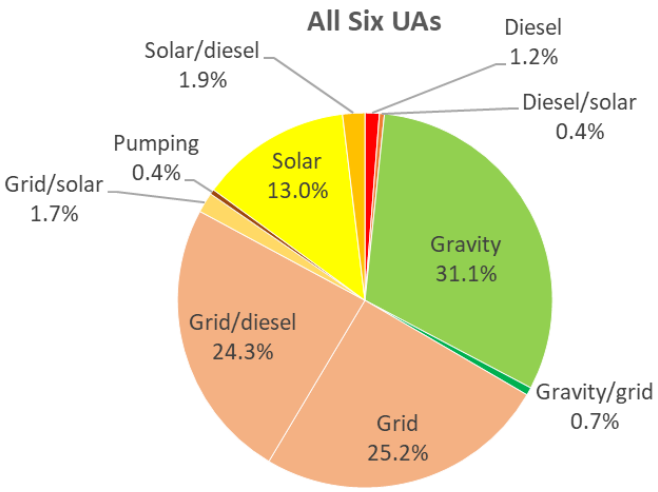


Fig. 2.3 – Types of water supply schemes by source of energy (% of water produced)

- There are very few schemes left that use diesel generators as main source of energy. They account for about 1.6% of the total water production (see pie chart above).
- Grid/diesel means that a standby diesel generator is available but that grid power is the main source of energy when there are no power cuts.

The **water resource used** is groundwater for more than 90% of the schemes (124 of 134 schemes for which water source information is available). Most pumping schemes are supplied from boreholes whereas the majority of the gravity flow schemes use springs. However, all UAs (except Karamoja) are also operating a small number of surface water treatment plants. Unfortunately, the data on water sources are too incomplete for a detailed analysis.

2.4 Number of Connections

Data sources & data quality

Total number of connections, active connections, metered connections and the number of public water points are monthly variables reported through UPMIS.

The data were cross-checked and gaps were filled using the UAs' Quarter 2 reports (Oct to Dec 2020) as well as the customer data from the Pegasus billing system (numbers of customers). The overall data quality is therefore rated as good.

In the original datasets the number of metered connections often exceeds the number of active connections, because some of the inactive connections are also counted as metered. In such cases the metering ratio (% metered connections) is given as 100%.

Results

Table 2.4 – Number of connections

As of December 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Total no. of connections	21,603	13,978	2,687	14,159	9,304	6,153	67,884
Active connections	18,986	11,772	2,064	12,659	8,052	6,059	59,592
No. of public water points*	476	155	77	720	248	435	2,111
% metered connections	100%	100%	100%	91%	100%	100%	98%

**Public standposts and water kiosks including pre-paid AQtap systems*

Total connections include connections that are currently not active (e.g. due to disconnection or absence of the owner) or that do not receive water.

Active connections are the ones receiving monthly water bills.

Interpretation

- In all UAs the metering ratio is close to 100%. All billing is done by consumption, with very few exceptions. Unmetered connections may exist temporarily when a scheme has just been taken over.
- The Mid-Western UA is operating 6 gravity flow schemes that are still unmetered or only partially metered. The amount billed for the unmetered connections, using a monthly lumpsum tariff, is only 7% of the total amount billed by Mid-Western UA.
- The average number of active connections per scheme ranges from 129 (Karamoja) to 336 (Eastern), with an overall average of 230 connections per scheme.
- There are only five UA schemes with more than 1,000 connections, three of which are managed by the Central UA.

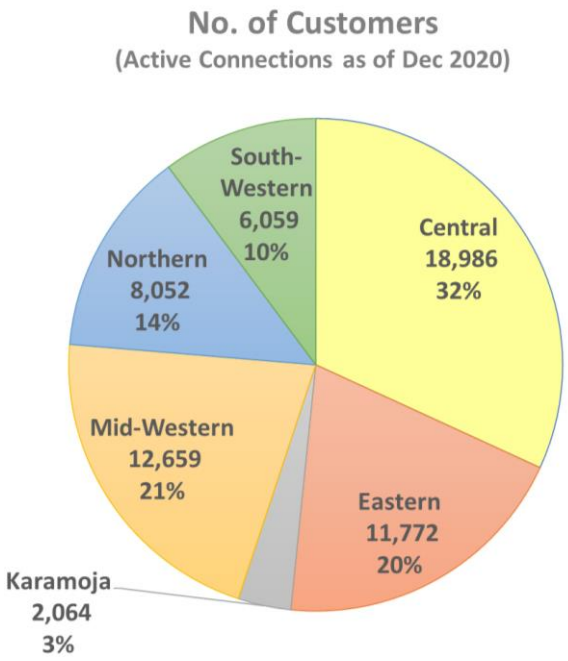


Fig. 2.4 – No. of customers (active connections) by UA

- The numbers of customers are distributed very unevenly. The Central UA alone accounts for almost one third of all connections of the UA schemes and has almost ten times more customers than the Karamoja UA. This has necessarily a strong impact on the UAs' ability to cover their overhead costs from revenue collections (see section 3.4).

2.5 Service Quality and Reliability, Customer Relations

Data sources & data quality

Data on "continuity of supply" are quite reliable. Other data in this section should be considered as rough estimates: Reporting on pipe breaks and other failures through UPMIS is more incomplete than for other parameters, and there seem to be inconsistencies regarding the definitions. The management of customer complaints is mostly based on local complaint books, and there is no central register or database that would allow detailed analyses.

Continuity of supply: This is a performance indicator used in UPMIS representing scheme functionality and service reliability. It is calculated from the parameter "no. of days without water supplied." Continuity of supply is 100% minus the percentage of days without water, calculated scheme by scheme. The overall value given for the UA is the weighted average of the individual schemes, with weighting based on the number of active connections of each scheme. Where UPMIS data were incomplete, quarterly report data were used to estimate missing values. "Days without water" are days when the entire system was down (e.g. failures of the water source, main pumps, transmission mains or reservoir). Situations where individual customers don't get water (e.g. due to low pressure or pipe breaks in the distribution network) are not captured by this indicator.

Pipe breaks/failures: UPMIS has the parameters "mains failures" and "service connection failures", but many schemes are not reporting on these parameters. To obtain consistent estimations, the totals for each Umbrella were corrected for missing data based on the mains length, for "mains failures", and the number of active connections, for "service connection failures". The "number of

pipe breaks", which is the parameter used in the IBNET toolkit, was calculated as the total of these two corrected parameters.

Intermittent supply: The number of customers receiving intermittent supply (i. e. less than 24 hours per day) is not available from UPMIS nor from other reports prepared by the UAs. As mentioned above, the UPMIS parameter on "continuity of supply" refers to the number of days when the entire system was down. The figures given are therefore based on rough estimates provided by the UA management through a questionnaire.

Number of customer complaints: The data available from UPMIS are too incomplete to provide a meaningful picture of customer complaints. In general, data reflect more the quality of reporting than the actual number of complaints received. The numbers given depend on the quality of complaints handling (and registration) at the scheme level as well as on the completeness of data entry into UPMIS. Data in UPMIS are complete for Karamoja, while completeness is between 40% and 50% for Central, Eastern and Mid-Western. Data for Northern and South-Western were not entered as less than 20% of the schemes were reporting on complaints.

Results

Table 2.5 – Service quality and reliability, customer complaints

Jan to Dec 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Continuity of supply *(% days with functional water supply)*	90%	90%	90%	96%	96%	91%	92%
Number of pipe breaks per year *(estimate)*	3,264	1,620	204	3,700	2,051	2,316	13,155
% of customers receiving intermittent supply *(estimate)*	38%	18%	59%	16%	n/a	15%	26%
Number of complaints per year (incomplete data)	*1,451*	*157*	*197*	*277*	*n/a*	*n/a*	*n/a*

Interpretation

- The “continuity of supply” is 90% or better for each of the UAs. On the other hand, this means that on average the schemes are non-functional during up to 10% of the time, which means an average of 3 days without water per month.
- Typical causes for these service interruptions are failures of the pumping system, problems with the transmission mains (e. g. due to landslides or roadworks), or reservoir leakages/repairs.

Due to the data limitations above, the other data in table 2.5 should be interpreted with caution. Comparisons between UAs are of limited value because they depend on differences in reporting and complaints handling.

- On average, more than a quarter of the customers have less than 24 hours water supply per day, according to estimations provided by UA management. Obviously, this depends on the local situation (supply, demand and pressure) in each of the schemes. A breakdown by scheme is not available. It is desirable to add this to the parameters to be reported by scheme operators.

- The number of customers receiving intermittent supply is lower in the South West, where the dominating gravity flow schemes are less vulnerable to failures (no pumping involved).

Background on customer complaints handing

The numbers on customer complaints are too incomplete for a meaningful interpretation. The most realistic value is for Karamoja, where the data in UPMIS are complete.

In general, the UAs' customer complaints handling is still at a basic level. Complaints are mostly handled at the scheme level, where most but not all water offices have complaints books. The level of follow-up from the regional HQ (Secretariat) varies. Other complaints are received through phone calls at the UA Secretariats. There is no software/database to handle customer complaints. Complaints are not analysed systematically and there is no evidence of closure of complaints.

2.6 WATER QUALITY

Data sources & data quality

All UAs have water quality testing programmes, with a good coverage of the schemes managed by the UA (usually one sampling day per scheme per quarter). Unfortunately, many of the existing analysis data were not uploaded to UPMIS, which has a special module to handle water quality data.

Complete or mostly complete water quality data are available in UPMIS for Mid-Western, South-Western and Karamoja UA, while incomplete data (first quarter only) are available for Central UA. The water quality data for Eastern and Northern UA have not been uploaded to UPMIS. Some complementary information was available from the UAs' quarterly (Q2) reports.

It was not possible, for this report, to collect, process and analyse raw water quality data that are not available in UPMIS or quarterly reports. The reliability of the information given below is therefore variable and the results are not fully comparable between the UAs.

Central UA: Unreliable data. The values given are based on incomplete UPMIS data (28 schemes for the quarter Jan to March 2020). The Q2 report (for Oct-Dec 2020) indicates higher compliance values but was not used as the report does not provide details on individual samples.

Eastern UA: Unreliable data, based on incomplete data from the Q2 report (for Oct-Dec 2020), which provides detailed analysis results for 21 schemes.

Karamoja UA: Reliable data from UPMIS

Mid-Western UA: Reliable data from UPMIS

Northern UA: Highly unreliable data. Q2 report (Oct-Dec 2020) gives values for "microbiological compliance" for each scheme, but it is not clear how these results were calculated and which period they represent. With only one sample taken in the quarter for each scheme, it should not be possible to calculate % compliance.

South-Western UA: Reliable data from UPMIS, not complete but covering most of the schemes.

Compliance with water quality standards by UA was obtained by calculating compliance individually for each scheme and then weighting the results by the number of active customer connections.

Results

Table 2.6 – Water quality

Jan to Dec 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
% compliance with microbiological WQ standards	*79%*[15] *(Jan-Mar 2020)*	*98% (Oct-Dec 2020)*	83%	82%	*(96%)*[16]	87%	n/a
% compliance with phys.-chemical with WQ standards	*84% (Jan-Mar 2020)*	*97% (Oct-Dec 2020)*	85%	96%	n/a	77%	n/a
No. of samples used for analysis*	75	58	106	321	n/a	111	

**No. of samples taken at customer taps or at reservoir tanks only, excluding raw water samples from the water sources.*

Interpretation

- Because of the differences in data availability, the values given for the individual UAs should not be comparted directly. It is likely that there are differences not only regarding data entry (upload), but also regarding sampling strategies and analysis methods.
- Microbiological contamination: Many samples show low counts of e. coli, with median values of 2 to 5 CFU (colony-forming units) per 100 ml. These had to be considered as non-compliant because according to the water quality standards any presence of e. coli is not acceptable. Significant contamination, with e. coli counts consistently above 15 (up to 136) per 100 ml, was observed for 11 schemes[17].
- Surface water without treatment: 6 of the schemes with significant microbiological contamination are operated by the Mid-Western UA. The reason is that Mid-Western UA has inherited several gravity flow schemes using surface water (water intakes from mountain streams in the Rwenzori area) that do not have any water treatment facilities. Investments to rectify this situation are urgently required.
- Compliance with phys.-chemical water quality standards: Non-compliance with these standards is in most cases not a health concern. The parameters that cause non-compliance are mainly
  - low pH, mainly observed in Central and South-Western UA;
  - high iron content, in particular in the South West (several schemes, max. 2.0 mg/l in Kahihi), less problematic values (up to 0.48 mg/l) measured in Eastern and Karamoja UA;
  - high turbidity and colour (mainly in Mid-Western, schemes with un-treated surface water).
- Salinity is not an issue in any of the UA schemes.

[15] Many samples with very low numbers of e.coli counts, with an average of 4 CFU e. coli per 100 ml

[16] Average of the compliance values given per scheme in the Q2 report; see comments on data reliability above

[17] Central: Kiyindi, Nangulwe, Ntenjeru; Eastern: Mukongoro; Karamoja: Nadunget; Mid-Western: Buhesi, Karugutu-Kithoma, Kitabu, Muhokya, Ntandi, Pohe; Northern: no data

Chlorination / water treatment

The IBNET toolkit requires data on the number of **tests of treated water for residual chlorine** (required number, no. of tests carried out and no. of tests that passed the relevant standard). These data are not available. Testing for residual chlorine is not part of the UAs' routine sampling programme, mainly because chlorination is done for very few schemes only.

The number of schemes with operational chlorination facilities is 77 in total (Central 9, Eastern 20, Karamoja 7, Mid-Western 18, Northern 22, South-Western 1). This represents less than 30% of all schemes managed by the UAs. Mostly these are the schemes with surface water treatment.

Conclusions

The highest priorities to improve compliance with water quality standards are:

1. Roll-out of chlorination, which is currently being done in less than 30% of the schemes.
2. Installation of water treatment plants for the schemes using surface water without treatment (Mid-Western UA).

2.7 Water Produced & Sold, Non-Revenue Water

Data sources & data quality

Water sold (billed): Data are highly reliable as they were obtained directly from the consumption data in the Pegasus billing system, where data are complete for all schemes. Virtually all connections are metered.

In some cases the monthly Pegasus consumption data showed sudden peaks that could not be explained by the volume of water produced. Probably these are due to carry over effects of the billing process or late entry of earlier customer data. In these cases, corrections were made using UPMIS data.

Water produced: Data at the Umbrella level can be considered as robust as they were calculated from many schemes, with best estimates for the ones with data gaps. Missing data and possible errors at the scheme level have only limited impact on the overall results.

Missing data on water production are mainly due to lacking or non-functional bulk water meters. To estimate the total volume of water produced, gaps were filled by using the same ratio between water produced and water billed as for the months with complete data. For schemes without any production data an estimate was made from the volume of water billed, applying the average percentage of NRW that was calculated for the UA. For this reason, the estimation process for gap filling does not affect the NRW results for the UA.

The water production data used are based on the readings of the bulk water meters that are closest to the water source. In UPMIS, measurements at or near the water source(s) are designated as "water produced". If there is no meter at the source itself - this is often the case for gravity flow schemes -, the records of the meter at the outlet of the reservoir were used; in UPMIS this is the value designated as "water supplied".

Non-revenue water (NRW) is the difference between water produced and water sold (billed), expressed as percentage of water produced.

NRW was calculated from the totals of water produced and water sold for all schemes.

Where data were incomplete, estimates were made for the periods without water production data, as described above. Where only "water supplied" is available, this value was used to calculate NRW, which means that losses along the transmission line (between the water source and the reservoir) are not captured. Schemes with neither water produced nor water supplied data for any period were not considered for calculating NRW.

Results

Table 2.7 – Water produced & sold, non-revenue water

Jan to Dec 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Volume of water produced [m³/year]	1,843,243	970,199	201,121	1,110,733	1,142,156	514,676	5,782,128
Volume of water sold (billed) [m³/year]	1,116,994	598,087	140,521	738,222	517,743	378,193	3,489,760
Non-revenue water [%]	39%	38%	30%	34%	38%* 55%	27%	36%* 40%

** The first value is excluding the Nyarwodho scheme, see discussion below.*

Interpretation

- There is urgent need for comprehensive NRW reduction programmes for all UAs. NRW for the four larger UAs (Central, Eastern, Mid-Western, Northern) ranges from 34% to 39%.
- Lower NRW in Karamoja is probably related to the significantly lower age of the schemes operated by Karamoja UA (see section 2.3).
- Lower NRW in the South West is partly due to the fact that most of the schemes here are gravity flow schemes, where water production at the source (spring) is usually not measured. The NRW of 27% therefore reflects the water losses of the distribution network only.
- Nyarwodho, a gravity flow scheme in the West Nile region with more than 200 km of pipeline mains, is one of the largest UA schemes and by far the largest of Northern UA. According to the data available, the NRW for Nyarwodho is 78% for the period Jan to Dec 2020 (7 months of production data available). As Nyarwodho accounts for 41% of the total water production of the Northern UA, this has a very strong effect on the NRW for the entire UA, and even on the overall NRW for all six UAs combined. The Nyarwodho case is complex and needs a special investigation on data quality and the causes of high NRW. There are indications that the values of water produced in Nyarwodho include large quantities of backwashing water. For these reasons, it was deemed useful to indicate both the NRW values with and without Nyarwodho.

2.8 WATER CONSUMPTION

In this section, the total amount of water sold, or total consumption, is broken down by types of customers, as required for the IBNET dataset.

Data sources & data quality

Reliable data from the Pegasus billing system. Uncertainties may arise from the definition of the customer types within the billing system. For example, small businesses could be considered as private domestic connections or as commercial connections, and institutional connections (such as schools) may be registered as private domestic connections under the name of a person. This has no impact on billing as the tariff is the same.

From the billing system, a breakdown by type of customer is not directly available for the volume consumed but only for the amount billed. The volume consumed was therefore estimated from the amount billed.

This is generally possible because the UAs apply the same tariff for all customers (except public water points), irrespective of the volume consumed. The percentages of the amount billed are therefore nearly the same as the percentages of the volume consumed.

However, a slight correction was necessary because the tariff for public water points is lower than the standard tariff for the other types of customers. On average, the tariff for public water points - i.e. the price of sale to the tap/kiosk attendant, not the price paid by the users - is about 70% of the normal tariff. The percentages of consumption through public water points were increased accordingly while the percentages for the other types of customers were reduced proportionally to maintain the total at 100%.

Results

Table 2.8 – Water consumption by type of customers

Jan to Dec 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Volume of water billed (sold) [m³/year]	1,116,994	598,087	140,521	738,222	517,743	378,193	3,489,760
Average monthly consumption per active connection [m³/month]	4.9	4.2	5.7	4.9	5.4	5.2	4.9
% sold through private domestic connections	83%	81%	71%	76%	77%	69%	79%
% sold through public water points	10%	8%	18%	12%	9%	17%	11%
% sold to institutional customers	5%	10%	9%	9%	12%	13%	8%
% sold to commercial customers	2%	1%	1%	3%	2%	2%	2%

Interpretation

- The average monthly water consumption is 4.9 m³ per customer (active connection), with little variation between the UAs.
- About 90% of the water provided by the UAs is used by households (customer types “domestic” and “public” in the Pegasus system, “residential” according to the IBNET terminology).
- Of the 90%, about 79% are sold through private domestic connections and 11% through public water points (public standposts and water kiosks). By far the most common type of domestic connections is the “yard tap”, installed outside the customer’s dwelling.
- In Karamoja and in the South West, where schemes have a more rural character, the share of public water points is somewhat higher.
- Close to 100% of the consumption is metered, except for Mid-Western UA where there are 9% of unmetered connections.
- Institutional customers account for about 8% of the total volume of water. The share of commercial customers is only 2%, on average. There may be cases, however, where institutions or small businesses are registered as private domestic connections in the billing system.

2.9 STAFFING

Data sources & data quality

Data on staff numbers are generally reliable. The data sources are UPMIS for the local scheme operator staff, and questionnaires filled by the UA management for the regional headquarter staff.

At the **scheme level**, support staff such as guards and pump attendants are usually included in the staff numbers, but this may not always be the case. Figures provided by UAs on staff numbers at scheme level may be lower than the figures given here, because support staff usually do not have separate contracts and therefore do not appear in the UAs’ human resources records.

Tap attendants at public standposts or water kiosks are not included in the staff numbers as they are not considered as staff members.

The staff numbers working in **faecal sludge management** were obtained by personal communication from UA staff.

Figures on **female personnel** as well as on **human resource management** are based on questionnaires filled by UA management.

Results

Table 2.9 –Staffing

As of December 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Total number of staff *(including local scheme operators)*	403	194	36	171	237	172	1,213
Staff at regional headquarter*	23	26	11	13	21	22	116
Staff working at scheme level	374	168	25	158	209	150	1,084
Staff working in faecal sludge mgmt.	6	-	-	-	7	-	13
Staff per 1000 connections	21	16	17	14	29	28	20
Staff per scheme managed by the UA	6.2	5.5	2.3	3.1	4.2	5.5	4.7
No. of female employees**	6	9	4	20**	4	8	51
No. of engineer positions held by female personnel	1	1	1	-	1	1	5

** Including support staff (secretary, drivers, guards)*

*** The figure for Mid-Western includes women working at the scheme level, who are employed by the UA. For the other UAs, scheme operators are not employees of the UA and the number of women working at the scheme level is therefore not available.*

Interpretation and complementary information

- Staff numbers per 1000 connections seem to be high. However, it should be noted that this is for the operation of a large number of small schemes, with an average of only 230 connections per scheme. The average staff numbers *per scheme* are 4.2 at the local level (scheme operators) plus 0.4 at the regional headquarter level, including support staff.
- Staff at the regional headquarters typically includes the UA Manager, 1 admin/accountant + 1 assistant, 3 to 6 technical professionals (engineers/ass. engineers, electro-mechanical technicians), 1 commercial officer, 1 social mobiliser, 1 water quality analyst, and support staff. Several UAs have additional support from trainees.
- Staff at the scheme level are not employees of the UA, with the exception of Mid-Western and partly Northern UA. The Mid-Western UA has decided to formally employ all key scheme operator staff (excluding guards and pump attendants). Northern UA is implementing a clustering concept where cluster managers are being employer by the UA. The other UAs have management contracts with the scheme operators, who receive a provision of typically 40% (in the South West 45%) of the revenue collections for their services.

- Staff in faecal sludge management: In 2020 only two UAs (Central and Northern) were involved in faecal sludge management activities and the scope of these operations is still very limited. The numbers given are for staff working at the faecal sludge treatment facilities (plant operation) or in faecal sludge collection/transport.
- Female personnel: On average, about 30% of the UA headquarter staff is female. This includes 1 engineer position in each UA except Mid-Western. The number of women working at the scheme level is not available.

Human Resource Management

The IBNET dataset also requires qualitative information on human resource management arrangements. The results with explanations are summarised in this section.

- Skills and training strategy: All UAs except Central stated that they have a skills and training strategy. The scope and level of detail of these strategies is not known. The Institutional Assessment of 2019[18] still stated that "training is implemented in an ad-hoc manner and there is no systematic assessment of training needs". All UAs have internal training programmes for scheme operator staff.
- Annual appraisal and target setting: All UAs stated that this is in place. Annual appraisals of the UA managers and regional headquarter employees is based on the public sector appraisal system. To which extent scheme operator staff are appraised against scheme level performance targets needs further investigation.
- Staff reward and recognition programme: All UAs except Central and Karamoja stated that they have reward and recognition programmes. Details on these programmes are not available.
- Staff recruitment and dismissal: The situation is complex. Key staff (UA Managers and key positions of the regional UA headquarter) are recruited through the Ministry's HR Department. The UA Manager gives recommendations on the takeover of trainees. Other staff is contracted locally, with various degrees of involvement of the Ministry and the UA's Executive Committee (Board). At the scheme level recruitment is done by the UA involving the Executive Committee.

[18] Institutional Assessment of the Umbrella Organisations in Uganda, Dorothy Kobel for World Bank, July 2019

3 FINANCIAL VIABILITY

3.1 TARIFFS

Data sources & data quality

The data on **tariffs per consumption** are reliable, derived from the Pegasus billing system.

The tariffs applied vary from scheme to scheme. The average tariffs for each UA were determined from the individual scheme tariffs. Calculating them directly from the total amount billed was not possible because the amount billed also includes a monthly service fee that is payable irrespective of consumption. The average tariffs were therefore calculated as weighted averages, where scheme tariffs have been weighted by the volume of water billed to calculate the average tariff.

The information on **water prices at public water points** is indicative. From the Pegasus system, only the price paid by the attendant of the water kiosk or public standpost can be obtained, but not the price paid by the consumers. The prices per jerrycan given below are therefore based on personal communications from UA staff, cross-checked against data in UPMIS.

Connection fees were also not available from the Pegasus system. A module to handle connection fees was being introduced in 2020 but could not yet be used for this analysis. The values given are therefore based on information provided by UA management through a questionnaire.

Results

The consumption tariffs in the table below are for all types of customers except public water points.

Table 3.1 – Tariffs

As of December 2020

All tariffs in UGX	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Average tariff per m³ consumed *(excl. VAT)*	3,262	2,209	2,419	2,412	2,159	1,975	2,565
Fixed monthly service charge *(excl. VAT)*	1,500	1,500	0	1,500	1,500	1,500	1,500
Av. monthly bill for a household using 6 m³ *(incl. VAT)*	24,867	17,407	17,125	18,846	17,057	15,753	19,928
Av. monthly bill for a household using 3 m³ *(incl. VAT)*	13,319	9,589	8,562	10,308	9,413	8,762	10,849
Water price at public water points, per jerrycan *(typical)*	100	100	50	100	100	50-100	(50-) 100
Connection fee for new connections *(typical)*	(100,000-) 250,000	100,000	150,000	300,000	150,000	100,000	100,000 - 300,000

Fig. 3.1 visualises the average tariffs from table 3.1, with and without VAT. The NWSC domestic tariff is also shown for comparison.

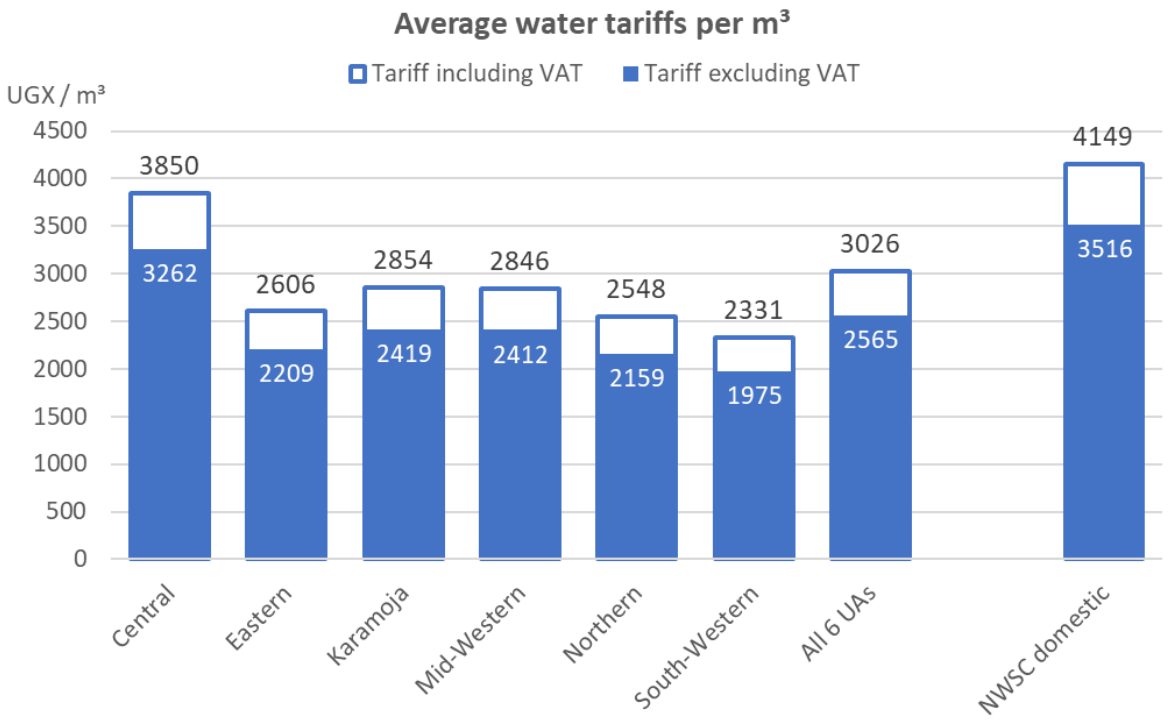


Fig. 3.1 – Average water tariffs of the UAs

Interpretation

- Tariffs are set individually for each scheme. Within the same scheme, user tariffs are the same for all types of customers (excluding public water points). Tariffs per unit are independent from the volume of water consumed. There were no block tariffs in 2020, but this will be piloted in 2021.
- The average water tariff across all UAs is 2565 UGX, excluding VAT, with the highest tariffs being charged in Central UA. The lowest tariffs are charged in the South-West, due to the high number of gravity flow schemes in this region.
- Comparison to NWSC tariff: The average UA tariff is 27% lower than the NWSC domestic tariff. The highest tariff charged in any of the UA schemes is 3,400 UGX, just below the NWSC tariff of 3,516 UGX. In the South West, the average tariff is 44% below the NWSC tariff.
- Monthly service charge: All UAs except Karamoja charge a constant monthly service fee of 1,500 UGX per connection.
- Affordability: With VAT and the monthly service charge a household using 3 m³ per month pays a monthly water bill between 8,762 UGX (South West) and 13,319 UGX (Central), on average. 3 m³ is equivalent to 20 litres per capita per day for a 5-person household.
- Public water points: The tariffs to be paid by the attendants of public water points are reduced compared to the standard tariff. The exact amount is set individually for each scheme. The purpose of the reduction is to allow a reasonable margin for the attendant while keeping the price for the customers affordable. Nevertheless, the usual price to be paid by customers is 100 UGX per jerrycan, which is equivalent to 5,000 UGX per m³. This is higher than the standard water tariff for private connections in any of the UA schemes. It is hence problematic to consider public water

points as pro-poor facilities. There are policies to reduce the tariff to 50 UGX per jerrycan but in practice this is rarely achieved, because of the need to remunerate the public standpost attendants. In Karamoja the price per jerrycan seems to be 50 UGX indeed. In the South West it is 50 UGX for gravity flow schemes and 100 UGX for pumping schemes.

- Connection fees: Connection fees are to some extent variable, depending on the distance of the customer from the pipeline and on the availability of funds for promotional (subsidised) connections. Some (but not all) UAs offer the option to pay connection fees in instalments. In general, customers are not ready to pay the full cost of being connected, which is of the order of 300,000 to 450,000 UGX according to UA staff. Increasing the number of customers therefore depends strongly on the availability of funds to subsidise connection fees.

Background on tariff setting and tariff variability

Tariffs are calculated by the UA Management based on local operation costs, but taking the scheme's history and political constraints into account.

The tariffs of existing schemes were inherited by the UAs at the time of takeover. Thereafter the UAs aim to achieve (local) cost recovery and to harmonize tariffs by type of technology, with lower tariffs for solar and gravity flow systems. Decisions are made through a negotiation process with the local authorities/communities, involving the UA's Executive Committees (Boards). The Ministry (with its Regulation Department) monitors affordability but is not directly involved in tariff setting. The formal approval of tariffs is in most cases still pending.

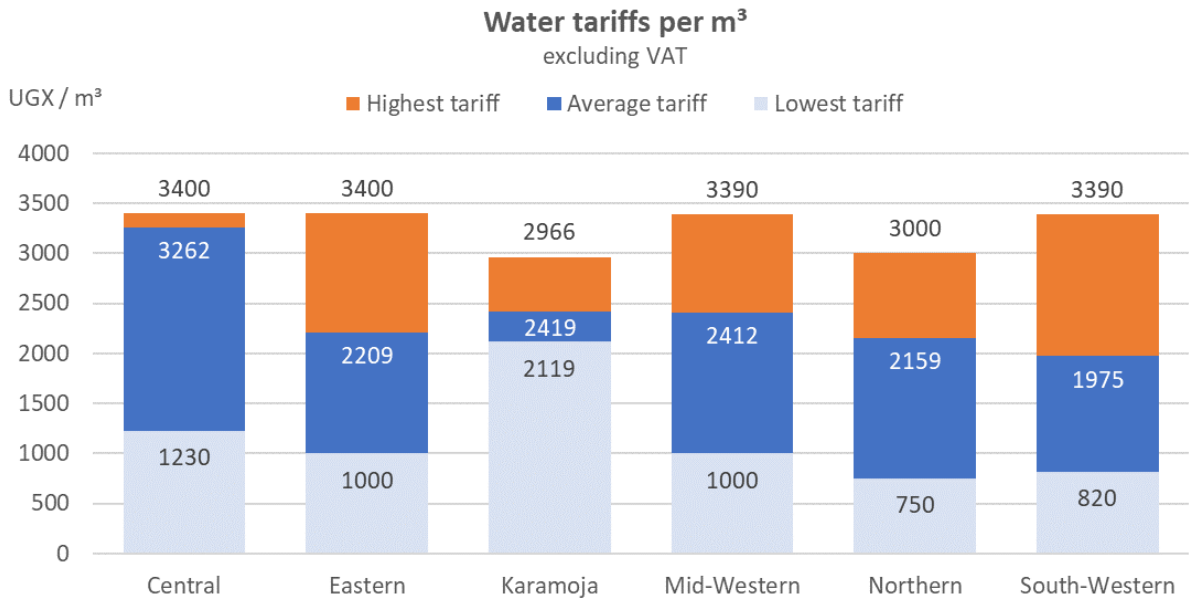


Fig. 3.2 – Variability of water tariffs

Fig. 3.2 shows that the individual scheme tariffs vary in a wide range, from 750 UGX to 3,400 UGX. The lowest tariffs (750 UGX) are being offered by Northern UA for the refugee schemes that were recently handed over. Other tariffs below 1,500 UGX are offered in exceptional cases, where political constraints or low willingness to pay made it necessary to start with a low tariff. Typical tariffs for gravity flow schemes are in the range of 1,500 to 2,120 UGX. The highest tariff charged in any of the schemes is 3,400 UGX.

3.2 Revenue Collections

Data sources & data quality

Data on both billing revenue and collections are directly and reliably available from the Pegasus billing and payment system. This system captures more than 90% of the total revenue of each UA.

There are however five types of revenue that are not (yet) captured by the Pegasus system: (i) Pre-paid water systems and AQtap water dispensers (Central UA only); (ii) Direct payments to the UAs' bank accounts (in most UAs now being entered in the Pegasus system); (iii) Connection fees; (iv) Revenue from renting out a building owned by the UA (South-Western UA only); and (v) Revenue from faecal sludge management.

Data on these five sources of revenue were added to the revenue from the Pegasus system, based on information received through a questionnaire filled by the UA Accountants and (for connection fees) UPMIS. Financial statements or balance sheets with a consolidated presentation of all sources of revenue were not available.

A breakdown of billing revenue by type of customer could be extracted from the Pegasus system.

Results

Table 3.2 – Revenue Collections

Jan to Dec 2020

All figures in million UGX		Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Total billing revenue *(all sources, excl. VAT)*		4,283	1,533	385	2,080	1,363	812	10,455
Total billing through Pegasus system *(excl. VAT)*		3,890	1,532	381	1,888	1,242	789	9,722
Total payments received through Pegasus system	*incl. VAT*	3,936	1,498	252	1,905	1,199	756	9,546
	excl. VAT	3,335	1,269	214	1,614	1,016	641	8,090
Revenue not through Pegasus system (pre-paid, connection fees)		372	1	4	192	118	23	710
Revenue from faecal sludge management		20	-	-	-	3	-	23
Total revenue (cash income actually received), *excl. VAT**		3,630	1,233	211	1,758	1,107	645	8,584
Revenue increase in 2020** *(Pegasus data)*		+16%	+22%	+61%	+30%	+23%	+39%	+23%
Collection efficiency		86%	81%	56%	85%	81%	79%	83%
Year-end accounts receivable *(excl. VAT)*		555	263	168	274	226	148	1,632

** 2.5% provision for Pegasus system is subtracted* ***Increase from Oct-Dec 2019 to Oct-Dec 2020*

Notes

VAT: 18%. Billing revenue is shown excluding VAT, as required for the IBNET database ("excluding all taxes"). Payments through the Pegasus system are shown both inclusive and exclusive of VAT. The payment collections are usually reported inclusive of VAT (as paid by the customer). The net amount of the payments (exclusive of VAT) is the one used to calculate collection efficiency.

Payments not through Pegasus system: The Pegasus system captures between 90% and 100% of the total revenue of each UA. Cash payments for regular water bills are not accepted in any of the UA schemes. Payments not through the Pegasus include the following five types of revenue:

- Pre-paid water systems and AQtap water dispensers (using pre-paid tokens to be purchased by the customers) – used in Central UA only. It is planned to integrate these systems with the Pegasus system in 2021.
- Direct payments to the UAs' bank accounts, sometimes preferred by institutional customers such as schools. In most UAs, except Central, these are now also entered into the Pegasus system, even if the payment platform is not used. The amounts for Central UA were added to the billing amounts obtained from the Pegasus system.
- Connection fees. Since 2020, the Pegasus system also handles connection fees but these were not available from the exported payment statistics and were thereadded manually to calculate the total revenue. The sources used were UPMIS and information provided by the UA Accountants.
- Revenue from renting out a building owned by the UA – South-Western UA only.
- Revenue from faecal sludge management: Negligible revenue of less than 0.5% of the total in Central and Northern UA only.

Collection efficiency, a KPI used in UPMIS, is calculated as the total amount of payments received divided by the total amount billed for water consumption.

Year-end accounts receivable, a parameter required for the IBNET database, represents the uncollected bills and is related to collection efficiency. It was calculated as the difference between the total amount billed and the total amount of payments received during the year. There is no procedure to write off payment arrears that are not recoverable.

Interpretation

- Collection efficiency in 2020 is clearly affected by the impact of Covid-19. The table below shows that without considering the months that were most affected by Covid (April to June 2020) the average collection efficiency would be 88% instead of 83%. See chapter 4 for further details.

Table 3.2b – Impact of Covid-19 on collection efficiency

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Collection efficiency Jan – Dec 2020	86%	81%	56%	85%	81%	79%	83%
Collection efficiency during Covid months (April – June 2020)	69%	65%	30%	71%	66%	66%	67%
Collection efficiency excluding Covid months	91%	88%	66%	90%	87%	86%	88%

- The collection efficiency in Karamoja is still significantly lower than in the other UAs: 56% compared to an average of 84% for the other five UAs. Even in the non-Covid months collection efficiency was only 66%. The Karamoja UA hence suffers from the double effect of a small customer base and a much lower collection efficiency, reflecting lower willingness/ability to pay for piped water.
- Revenue is very unevenly distributed between the UAs. The Central UA's revenue is more than fifteen times higher than the Karamoja UA's. Fig. 3.3 shows a visual comparison of the average monthly amounts billed and collected through the Pegasus system, inclusive of VAT.

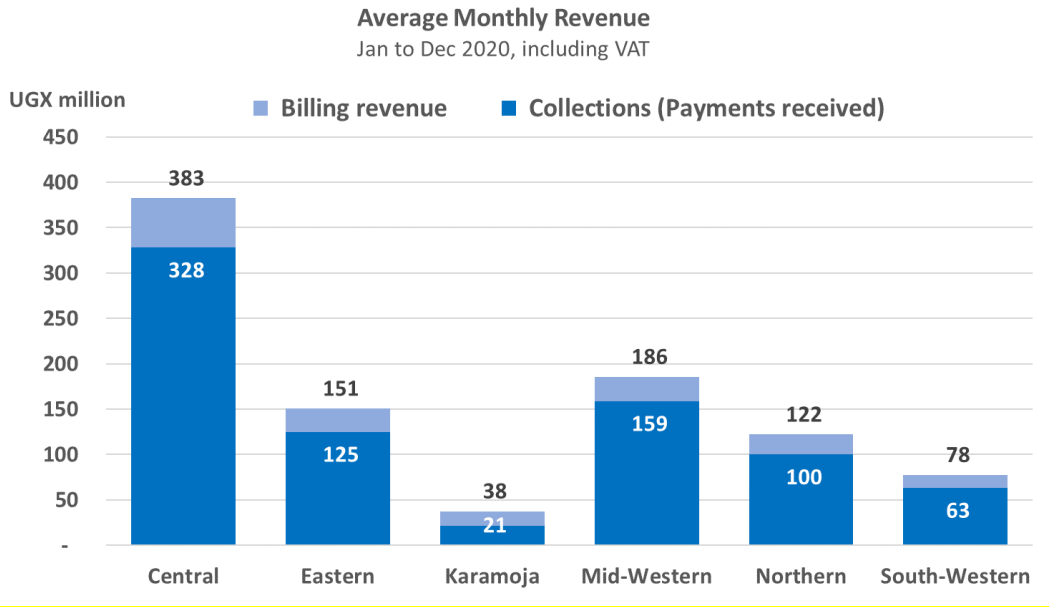


Fig. 3.3 – Comparison of billing revenue and collections by Umbrella (Pegasus system)

Breakdown of revenue by type of customers

The IBNET database also requires a breakdown of revenue by type of customers. The table below shows the share of each type of customers in the total billing revenue, derived from the Pegasus system.

Table 3.2c – Billing revenue by type of customers

Jan to Dec 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Private domestic connections	85%	83%	75%	79%	79%	72%	81%
Public water points	7%	5%	13%	9%	7%	12%	8%
Institutional customers	5%	10%	10%	10%	12%	14%	8%
Commercial customers	2%	1%	1%	3%	2%	2%	2%

The real share of institutional and commercial customers might be somewhat higher than shown in the table. As explained in the section on water consumption (2.8), there may be some ambiguity regarding the definition of customer types within the billing system. It seems that small businesses and institutions such as schools are sometimes registered as private domestic connections under the name of a person. This has no impact on billing as the tariff is the same.

Trends of revenue collections and collection efficiency

The following figures visualise that both the revenue collections and the collection efficiency showed positive trends in 2020, despite the impact of Covid-19. The period analysed is from July 2019 to January 2021.

From the last quarter of 2019 (Oct-Dec) to the last quarter of 2020, the total collections (payments actually received) have increased by 23% (see Fig. 3.4a and Table 3.2). A positive trend was observed for each of the UAs (see Fig. 3.4b), with the highest rates of improvement reported for the smallest UAs (Karamoja: +61%, South West: +39%).

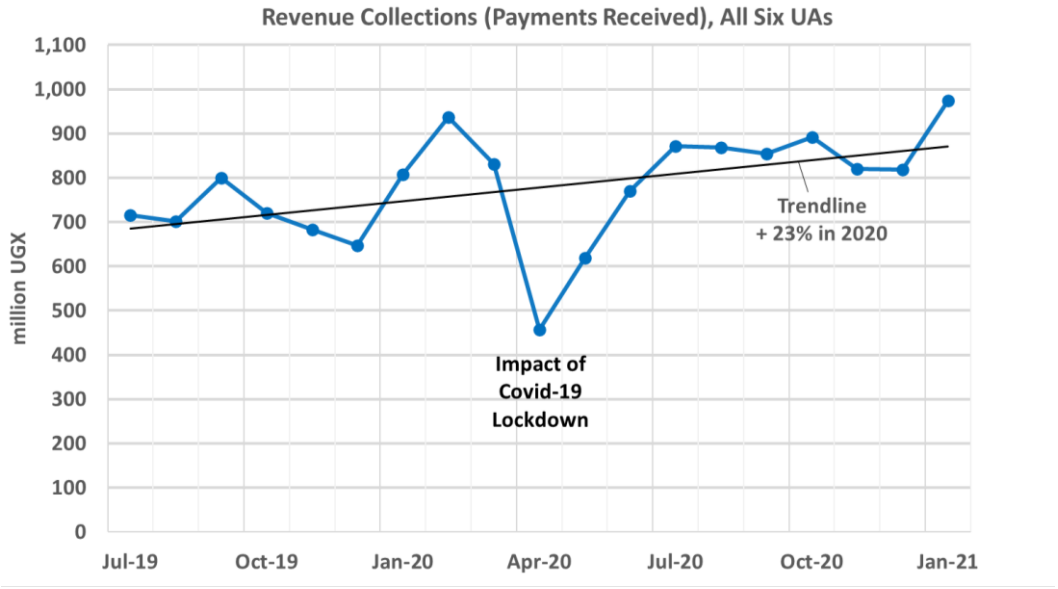


Fig. 3.4a – Trend of revenue collections, July 2019 to January 2021, all UAs combined

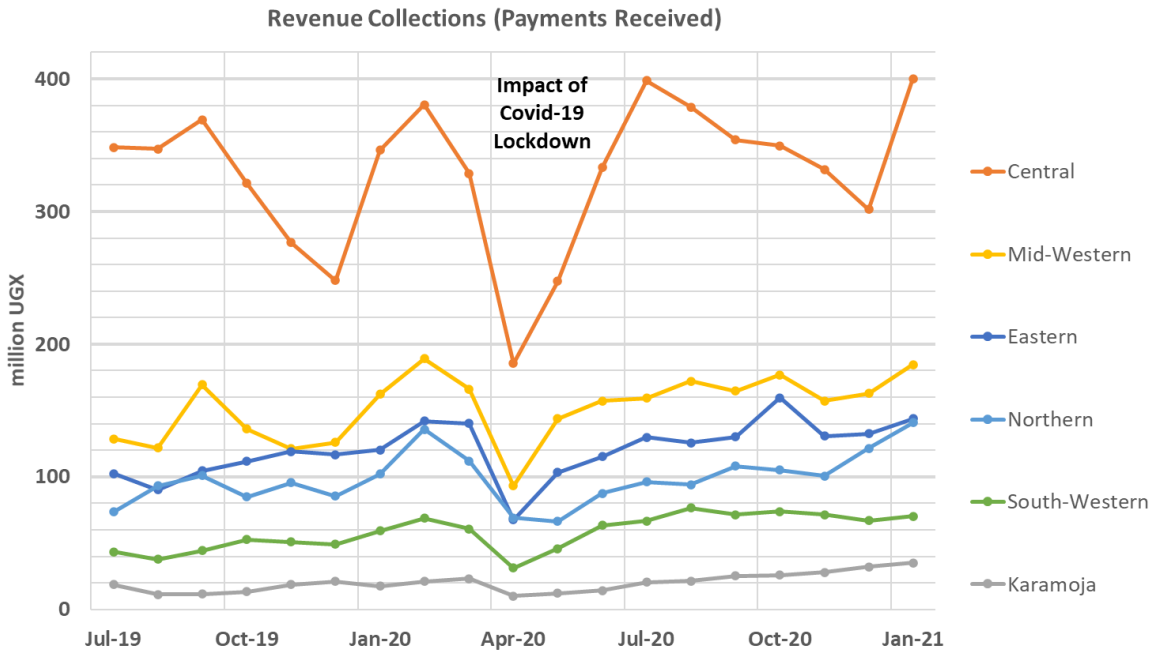


Fig. 3.4b – Trend of revenue collections, July 2019 to January 2021, by UA

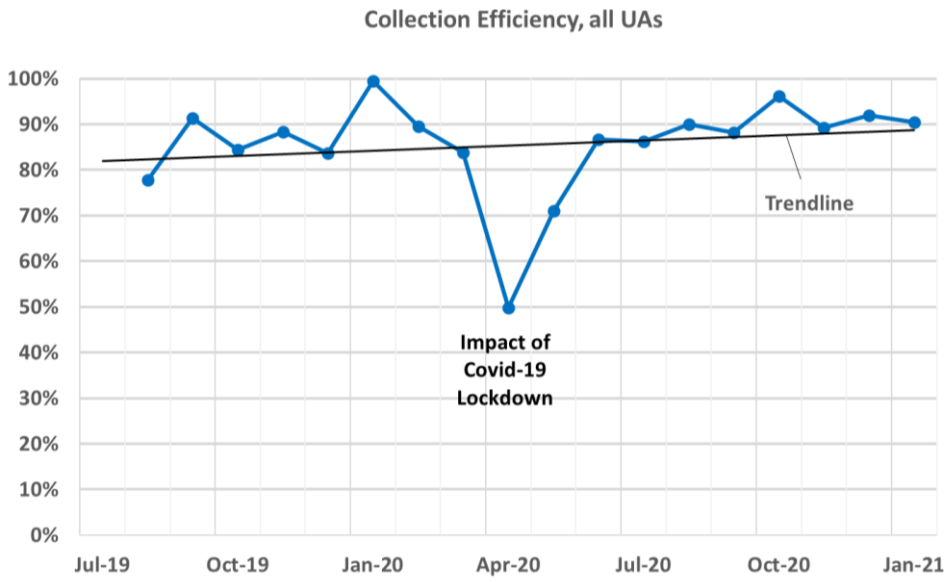


Fig. 3.5 – Trend of collection efficiency, July 2019 to January 2021

3.3 Operation & Maintenance Costs

Data sources & data quality

The UAs are currently not preparing corporate financial statements from which expenditure categories would be readily available.

All information on O&M costs is based on information compiled by the UA Accountants, using a spreadsheet format that was sent out for this purpose. Data were provided by quarter, in line with the usual quarterly reporting interval of the UAs.

O&M costs in UPMIS were not used as they are incomplete and only capture the costs at the scheme level, not the overhead expenses at the regional headquarter level.

The format filled by the UA accountants distinguishes the following cost categories:

- Regional HQ level: Staff costs (salaries & allowances), transport, office running, water quality testing, training/workshops/mobilisation, and other overhead expenditure.
- Scheme level: Remuneration of scheme operators, electricity, fuel for generators, transport, chemicals, minor repairs & routine maintenance, local water office, minor O&M costs handled by the scheme operator, and support to the local water & sanitation committee.
- Sanitation: Faecal sludge treatment, emptying & transport, and O&M of public toilets.

To the extent possible, inconsistencies or doubts regarding these cost categories were clarified by personal communications. However, there may still be cases where the understanding of definitions was not the same or where some cost categories were not available separately. This should be harmonised in the process towards preparing financial statements in the future.

For cost items (inputs) that are assumed to include VAT, such as electricity and other taxable goods, the costs shown are exclusive of VAT, i.e. by dividing the original value given by the accountants by 1.18 (for 18% VAT). This is to be consistent with revenues, which were also shown exclusive of VAT. UAs subtract input VAT from output VAT and pay the balance on a monthly basis.

Results

Table 3.3 – Operation & Maintenance Costs

Jan to Dec 2020

All figures in million UGX, % of total O&M costs in italics below	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Total Operational expenses, *including investments, for IBNET*	4,306	2,812	1,496	4,637	2,780	2,661	18,692
Total running O&M costs, *excluding investments*	3,399 *100%*	1,492 *100%*	719 *100%*	1,955 *100%*	1,418 *100%*	1,252 *100%*	10,235 *100%*
Costs incurred at regional HQ (*staff, transport, office etc.)*	730 *22%*	297 *20%*	522 *73%*	617 *32%*	488 *34%*	695 *55%*	3,348 *33%*
Costs incurred at scheme level *(scheme operators, energy, other local O&M costs)*	2,657 *79%*	1,195 *80%*	197 *27%*	1,337 *68%*	930 *66%*	558 *45%*	6,874 *67%*
Staff costs / regional headquarter	282 *8%*	232 *16%*	167 *23%*	206 *11%*	255 *18%*	375 *30%*	1,516 *15%*
Staff costs / scheme operators	1,380 *41%*	606 *41%*	79 *11%*	562 *29%*	553 *39%*	337 *27%*	3,516 *34%*
Electricity costs*	1,046 *31%*	316 *21%*	42 *6%*	269 *14%*	97 *7%*	31 *2%*	1,802 *18%*
Water quality testing & treatment*	159 *5%*	54 *4%*	71 *10%*	121 *6%*	76 *5%*	16 *1%*	497 *5%*
Minor repairs & routine maintenance*	137 *4%*	144 *10%*	31 *4%*	344 *18%*	38 *3%*	70 *6%*	765 *7%*
Other costs (transport, office running etc.)	383 *11%*	139 *9%*	328 *46%*	453 *23%*	400 *28%*	423 *34%*	2,124 *21%*
Faecal sludge management	13 *0.4%*	-	-	-	1 *0.1%*	-	14 *0.1%*

** exclusive of VAT*

The percentages above were calculated as percentages of the running O&M costs, excluding investments such as scheme extensions or of major repairs/replacements. The latter are highly variable as they depend on the availability of external funding (see following sections for details).

Discussion and Interpretation

– *See refer to the charts of Fig. 3.6 below for a visualisation of the cost components by UA* –

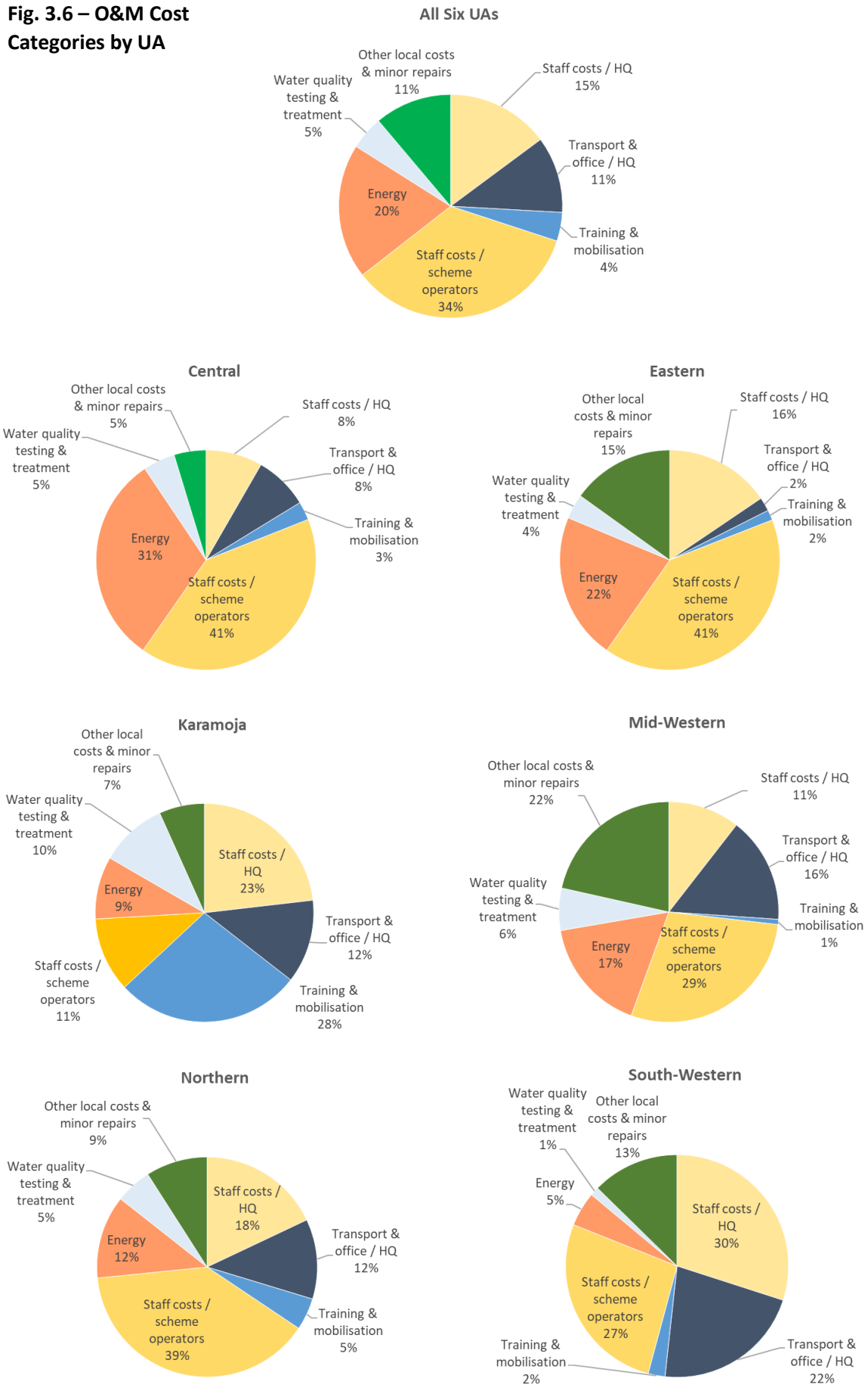
- On average, the regional headquarter offices – staff, transport and office running costs – account for about one third of the UAs' total O&M costs. However, this percentage is higher in the two smallest UAs, South-Western (55%) and Karamoja (73%). This is plausible as certain overhead

costs at the regional level are unavoidable, even if the customer base and the water production are small. The larger UAs are benefitting from economies of scale.

- The regional staff costs alone – salaries and allowances of staff working at the headquarter – represent 15% of the total O&M costs, on average, again with higher values for South-Western and Karamoja UA.
- The remuneration of the local scheme operators amounts to 34% of the total O&M costs. This is line with the arrangement that in most UAs the scheme operators receive 40% of the revenue collections for their services. Only Mid-Western UA and partly Northern UA have formally employed the scheme operators (see section 2.9).
- The Karamoja UA is reporting high costs for training and mobilisation (28% of the total O&M costs). It can be assumed that this is because in 2020 the Karamoja UA was preparing a large number of schemes[19] for management by the UA, to be taken over in 2021.
- The share of energy costs varies in wide range because of the different technology mix described in section 2.3. The Central UA has by far the highest energy costs, with a monthly electricity bill of about UGX 100 million, and spends one third of the total O&M costs on energy. Karamoja, where most of the schemes are solar powered, spends only 10% on energy (electricity and fuel for backup generators). The South-Western UA, which is mainly operating gravity flow schemes, even spends only 5% on energy.
- The costs for water quality testing & treatment account for only 5% of the O&M cost. The larger part of this is for the UAs' water quality testing programme. The cost of chemicals for actual water treatment is only 2% of the O&M costs, reflecting the fact that regular water treatment is only done for the few schemes with surface water intakes. This may have to change in the future, because of the need to roll out chlorination (see section 2.6).
- Minor repairs & maintenance: Minor repairs and regular maintenance works are done by the local scheme operators using a small cash advance ("imprest") they receive for this purpose as well as for running the local water office and transport (if any). Major repairs and expensive maintenance works, such as the outsourced maintenance of generators, are paid by the headquarter. The way how these cost items are handled and accounted for varies to some extent between the UAs. The figures and percentages given are therefore not fully comparable.
- The O&M costs for the UAs' activities in faecal sludge management (Central and Northern only) are still minimal, accounting for less than 0.5% of the total O&M costs.

[19] Alakas, Kopoth, Lokolia, Lolachat, Longariama, Lopei, Lorengecora, and Lorukumo (Moroto)

Fig. 3.6 – O&M Cost Categories by UA



3.4 Cost Recovery and Subsidies

This section analyses to which extent the UAs' revenue collections cover the O&M costs, and how the remaining gap in cost recovery is being filled by subsidies.

Please note that the findings in this section are based on preliminary data provided by the UA accountants. The calculations made cannot replace consolidated financial statements, which are currently not yet being prepared for the UAs. A more detailed assessment by a financial expert would be desirable.

Financial reporting by the UAs currently follows the public sector accounting standards and will need to be revised to suit the requirements of a water utility.

Data sources & data quality

The origin of the data on revenue and O&M costs was described in detail in the previous sections.

Data on subsidies were made available by the UA Accountants by filling a quarterly financial reporting format prepared for this purpose. The format distinguishes the following categories:

- Donor or project funding
- Government funding – conditional grant
- Government funding in cash
- Government funding in kind (e.g. by providing pipes and water meters)

Additional information on the allocation of government funds under the project known as SCAP100 – 100% Service Coverage Acceleration Project – were provided by the Ministry of Water and Environment, Urban Water and Sewerage Department.

Note on the concept of cost recovery

Cost recovery will be understood here as operational cost recovery, i. e. the extent to which the revenues cover the running operation and maintenance costs.

The indicator used – the **operating cost coverage** ratio – is defined accordingly as the total revenue collections (actually received) divided by the running O&M costs. A value above 100% indicates that the UA is able to cover part of the capital maintenance costs, such as major repairs and replacement of equipment or assets.

Full cost recovery – including the reinvestment costs to maintain the assets in good working condition and to replace them at the end of their service life – is currently not realistic. Furthermore, the costs of asset depreciation have not been established.

Results

Table 3.4 – Cost recovery and subsidies

Jan to Dec 2020

All figures in million UGX	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Total net revenue (actually received) 2020, *excl. VAT*	3,630	1,233	211	1,758	1,107	645	8,584
Total running O&M costs 2020, *excl. VAT*	3,399	1,492	719	1,955	1,418	1,252	10,235
Operational surplus/ deficit in 2020	+231	-259	-508	-197	-311	-607	-1,651
Cost coverage ratio	107%	83%	29%	90%	78%	52%	84%
Total Subsidies	1,500	2,575	1,665	5,178	3,116	2,511	16,545
Government subsidies *(SCAP100 project and conditional grant)*	1,500	2,575	1,665	4,907	2,021	2,511	15,179
Donor or project funding*	-	-	-	271	1,095	-	1,366

** Funds handled through the UA accounts only. Investments directly funded by donors are not included.*

Interpretation

- In 2020, the UAs were able to recover about 84% of their running O&M costs from revenue collections. The total operational deficit of the five UAs that are not breaking even was about UGX 1.9 bn.
- **Note that this result is influenced by the impact of Covid-19, which led to significantly lower collection efficiencies during several months of the year. Without the negative impact of Covid-19 on revenue collections, cost coverage would have reached around 90%.**
- All UAs, including Karamoja, recover the direct O&M costs incurred at the scheme level, i.e. the remuneration of scheme operators, pumping costs and other local O&M costs. The costs of the regional headquarters are not yet fully covered, except for the Central UA.
- The Central UA was breaking even in 2020, covering the running O&M costs including the costs of the regional headquarter plus a small margin of 7% that can be used for minor investments. Without the impact of Covid-19, the collections would have been higher by at least 5% (see section 4). In a normal year, the Central UA will hence generate a surplus of about 12% above the running O&M costs.
- The Mid-Western UA covered about 90% of the running O&M costs and can be expected to break even soon in a normal year (without the negative effect of Covid-19) and with the expected benefits from the ongoing investment programme.
- The Eastern and Northern UAs covered 83% and 78%, respectively, of the running O&M costs and would have reached about 85% to 90% without the impact of Covid-19. With further increases of

the number of customers, due to ongoing investments and takeover of schemes, they can be expected to break even within the next few years.

- The South-Western and Karamoja UAs currently have a too small customer and revenue base to bear the overhead costs of their regional headquarters, which represent more than 50% of their total O&M costs. Subsidies of the running costs will continue to be required in the medium term.

Subsidies

- In 2020, substantial subsidies were made available that covered not only the operational deficit but also allowed to invest in infrastructure improvements.
- The largest contribution was through the government project known as SCAP100 (100% Service Coverage Acceleration Project). These are funds mainly intended to fund scheme extensions to unserved areas and network intensification to connect more customers. The total amount disbursed between July and December 2020 was about UGX 9.2 bn. As most of the funds were released during the last months of 2020, the impact of the investments made on revenue is hardly reflected in the collections of 2020.
- A more continuous source of subsidies are the conditional grants, originally designed to support local governments to run and expand their water supply infrastructure. As the UAs have taken over the management of most of the schemes the conditional grants were redirected to support the UA operations. The total amount disbursed in 2020 was UGX 2.5 bn, which represents 23% of the total O&M costs of the UAs.
- Two of the six UAs additionally benefitted from donor funding.
  - The Mid-Western UA was supported by the WSUP project (Water and Sanitation for the Urban Poor, funded by the Conrad N. Hilton Foundation).
  - The Northern UA received funds from the KfW emergency response (Covid-19) and GIZ capacity enhancement programmes.

  The figures shown reflect only direct support to the UAs. Investments that were directly funded by the projects are not included.
- Limited donor support was also given by funding consultancies and capacity building/training, namely by the USHA project (funded by USAID) and WaterAid. This support was provided in kind and is not included in the above figures.
- The two financially weakest UAs, Karamoja and South-Western, are currently without any donor support.

3.5 Investments

Investments are understood here as all expenses to improve, expand or replace the UAs' assets. These include network extensions and new connections as well as capacity increases and replacement of equipment.

Substantial new investments are not handled by the UAs, but by the WSDFs (Water and Sanitation Development Facilities), which are regional de-concentrated units of the Ministry of Water and Environment.

Some UAs, in particular Mid-Western through the WSUP project, benefit from investments directly paid by the donor, not through the UA accounts. The amounts of these investments are not included here.

Data sources & data quality

The figures on "length of network renewed during the year" – one of the values required for the IBNET dataset – were obtained from UA management using a questionnaire. The question was split into:

- New pipelines laid during the year
- Existing pipelines renewed.

Financial data on investments were provided by the UA Accountants by filling a quarterly financial reporting format prepared for this purpose. The format provided for the following categories:

- Costs of new connections and water meters
- Costs of major repairs and replacement of equipment
- Extensions and capacity increases - investments from own funds
- Land compensation
- Investments from external resources but through the UA's accounts
- Investments in UA's assets by others (e.g. projects, local government)

In the table below these categories are not presented separately because they could not always be distinguished reliably. As the UA accountants are using different cost categories (by type of expenditure), the distinction between maintenance costs and new investments is complicated. Also. the distinction between funding from own resources and external resources is often not possible.

The figures given below are therefore indicative and may not be fully comparable between the UAs.

In table 3.5 the amounts are shown exclusive of VAT, assuming that VAT on inputs for investments can be deducted from the output VAT on revenue collections.

Results

Table 3.5 – Investments

Jan to Dec 2020

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Length of existing pipelines renewed during the year [km]	18	13	23	15	72	5	145
Length of new pipelines laid during the year [km]	105	51	52	123	70	41	442
New investments during the year 2020 [million UGX]*	907	1,320	777	3,153	1,362	1,409	8,927

** Investments directly funded by donors (not through the UAs' accounts) are not included.*

"New investments" is the best estimate of the amounts invested in the renewal of existing infrastructure plus construction of new infrastructure, exclusive of VAT. Investments directly funded by donors (not through the UAs' accounts) are not included.

Interpretation

- The length of existing pipelines renewed in 2020 represents 3% of the total network length of the UAs.
- The length of new pipelines laid in 2020 is equivalent to an expansion of the network by 9%, with a range from 6% (Eastern) to 22% (Karamoja).
- The total amount invested in 2020 was about UGX 8.9 bn (10.2 bn incl. VAT). This exceeds the total amount of revenue collected by the UAs (UGX 8.6 bn).
- The rate of investment in the UAs' infrastructure was hence satisfactory in 2020, but almost entirely depending on external funding.
- The main source of funding for investments was the SCAP100 government project with an amount of UGX 9.2 bn.
- The Mid-Western and Northern UAs additionally benefitted from limited donor funding of investments:
  - Mid-Western: WSUP project (Water and Sanitation for the Urban Poor, funded by the Conrad N. Hilton Foundation), support towards system expansion, construction of PSPs and new connections
  - Northern: KfW Covid-19 emergency response plan for water extensions to isolation centres.

Loans

- The UAs currently do not handle any government or commercial loans. All investments are grant funded

Asset ownership and depreciation

Currently there is no system for asset valuation and depreciation in place.

All infrastructure managed by the UAs is considered as government property, which the UA (as Water Authority) receives in trust for management. New schemes and new assets are handed over to the UA for operation and service provision but they are not formally owned by the UA.

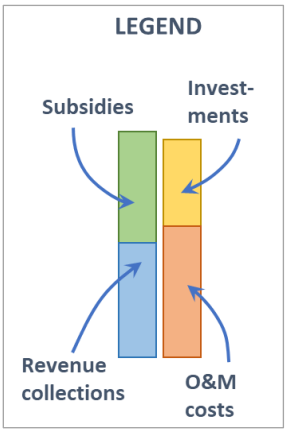
3.6 Conclusions on Financial Viability

Disclaimer

The findings on financial viability presented in this report are not based on audited financial statements, nor was a financial expert involved. All information is indicative, based on simple balances of the available data on revenue, running O&M costs, subsidies and investments made. It is desirable to introduce corporate style financial reporting for the UAs as soon as possible.

Revenue, O&M costs, subsidies and investments in 2020

Revenue collections, O&M costs, subsidies received and investments made by the UAs were each discussed in the previous sections. The figure below now presents a visual comparison of the four items.



For each UA, the left bars represent income (revenue collections plus subsidies) while the right bars represent expenditure (running O&M costs plus infrastructure investments).

Comparing the blue and the red section – revenue collection vs. O&M costs – represents the operational cost coverage ratio.

Of the subsidies (green section), a small part covers the operational deficit (if any) while the remainder is used to finance investments.

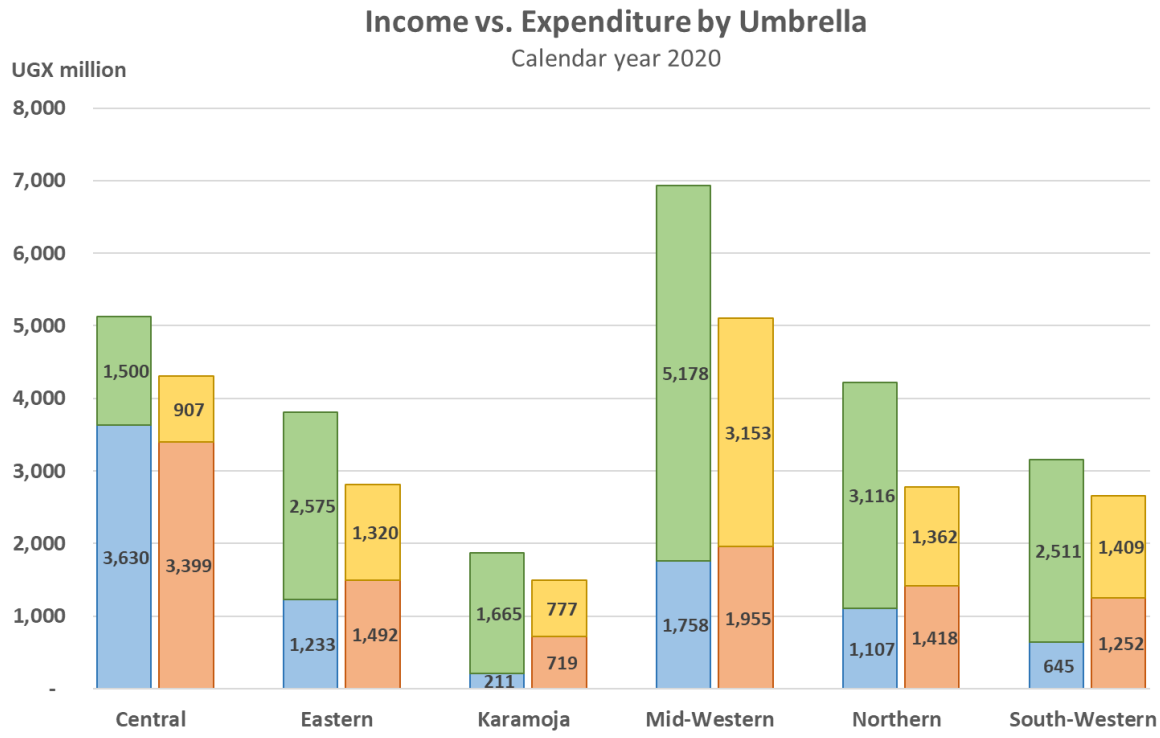


Fig. 3.5 – Comparison of revenue, O&M costs, subsidies and investments in 2020 by UA

- Central is the only UA where revenue collections exceeded the running O&M costs in 2020. All other UAs used as small part of the subsidies to cover the operational deficit.

- More than 90% of the subsidies received were government subsidies, with the largest contribution coming from the SCAP100 project. Mid-Western received the highest allocation of SCAP100 funding and additionally benefitted from donor support.
- The largest tranche of SCAP100 funds was disbursed during the last quarter of 2020 (i.e., quarter 2 of financial year 2020/21) at rather short notice. This explains at least partly why the amount spent (invested) is less than the amount received for each of the UAs.

Conclusions and strategic considerations

1. There are positive trends of revenue collections – amount collected and collection efficiency – in all six UAs. However, only Central UA achieved cost recovery of running O&M costs in 2020. Mid-Western, Eastern and Northern UA can be expected to break even within the next few years.
2. Without the impact of the Codid-19 pandemic, cost coverage would have been higher by about 6 percent points, on average (see chapter 4).
3. South-Western and Karamoja will need operational subsidies in the medium term. While this might have been expected for Karamoja, the reason in the South West is that most of the urban systems in this region have been handed over to NWSC. The UA is mostly managing rural gravity flow schemes with a very small customer base. These have low direct operation costs (as there are no pumping costs) but do not generate enough revenue to sustain the regional overhead costs of the UA.
4. The financially weakest of the UAs – South-West and Karamoja – have no external support other than from GoU. It is recommended to encourage donor support to these two UAs.
5. The example of South Western UA shows that if UAs are to be financially viable, they need a reasonable customer base and hence some sizeable small towns among their service areas. If all such schemes are handed over to NWSC, the UAs cannot be expected to become financially viable utilities.
6. All UAs, including Central, depend on external support for major investments, such as rehabilitations or capacity increases. However, with the current trends of revenue collections, four of the six UAs (except Karamoja and South Western) can be expected to generate a small surplus beyond the running O&M costs within the next few years. This will allow to finance minor investments such as network extensions and replacement of electro-mechanical equipment.
7. Staff costs account for about half of the UAs' total O&M costs. However, UAs are far from overstaffed. Staff efficiency is limited by the need to manage a large number of very small, geographically separated schemes.
8. There is little room for tariff increases due to affordability/willingness to pay and political constraints. It seems more viable to increase revenue by connecting more people and by upgrading the service level, i. e. replacing public water points by private connections[20]. This strategy has the double benefit of contributing to the sector targets, in terms of increasing service coverage, while improving the financial viability of the UAs.
9. All UAs have confirmed that there is strong demand for more private connections. However, as people are usually not able or not ready to pay the full price of the connection, connection fees will have to be subsided.

[20] From a pro-poor perspective, water from private taps is less expensive than buying water from a public water point by jerrycan. From the UA's point of view, revenue can be expected to increase due to increasing consumption per customer and by eliminating the costs of the "middle man" (tap attendant).

4 IMPACT OF COVID-19

4.1 INTRODUCTION

The analysis below is limited to the *financial* impact of the Covid-19 pandemic, specifically the lockdown imposed from 31st of March 2020 and gradually eased from May 2020.

In general, the UAs were exempt from travel restrictions and were able to maintain water supply services without major restrictions (see section 4.4). A substantial deterioration of the service quality has not been observed.

There were a number of specific activities to address the pandemic, such as emphasising the importance of handwashing and extending water supply services to isolation centres (with support of KfW, Northern UA). Details on these activities were not available and beyond the scope of this report.

The impact of Covid-19 to be examined here is the reduction of revenue collections during the lockdown period. This is mainly related to political guidance that payment of utility bills should not be enforced during the lockdown period, acknowledging the fact that many citizens saw their earnings reduced or had even lost their source of income.

4.2 DATA SOURCES

The data used to analyse the impact of the Covid-19 pandemic are monthly data of billing and revenue collections for each of the UAs, from July 2019 to January 2021. All data were obtained directly from the Pegasus billing and payment system[21].

The start month July 2019 was chosen in order to have a sufficiently long reference period before the beginning of the impact in April 2020.

4.3 METHODOLOGY TO QUANTIFY THE FINANCIAL IMPACT OF COVID-19

The main financial impact of Covid-19 was the reduction of revenue collections during the lockdown period. In order to quantify this impact, a simple model was developed that allows to compare the actual revenue collected with the revenue that could have been expected without the effect of the lockdown.

First, it was checked whether the amount billed was affected by the lockdown (see next section). This was apparently not the case, or not significantly. Water distribution and billing continued almost normally. Therefore, the original values of amount billed could be used directly, without estimations.

The theoretical revenue that would have been collected without the impact of Covid-19 was then estimated by multiplying the amount billed with the "normal" collection efficiency. The normal collection efficiency during the lockdown months was estimated by fitting a trendline through the values of collection efficiency of the months before and after the lockdown.

The difference between the actual collections and the collections that could have been expected represents the estimated revenue loss due to Covid-19.

[21] For Karamoja, three of the Pegasus values were extremely high for unknown reasons: Nakapelimoru January and May 2020, Nakapiripirit March 2020. These were replaced by the UPMIS values.

This estimation was done individually for each UA. Finally, the overall impact on the UAs was calculated from the total of the losses of each UA.

4.4 Service Delivery Throughout the Lockdown Period

The customers' monthly water consumption is directly linked to the amount billed. In the charts below, the amount billed is therefore a proxy for water consumption and hence service delivery.

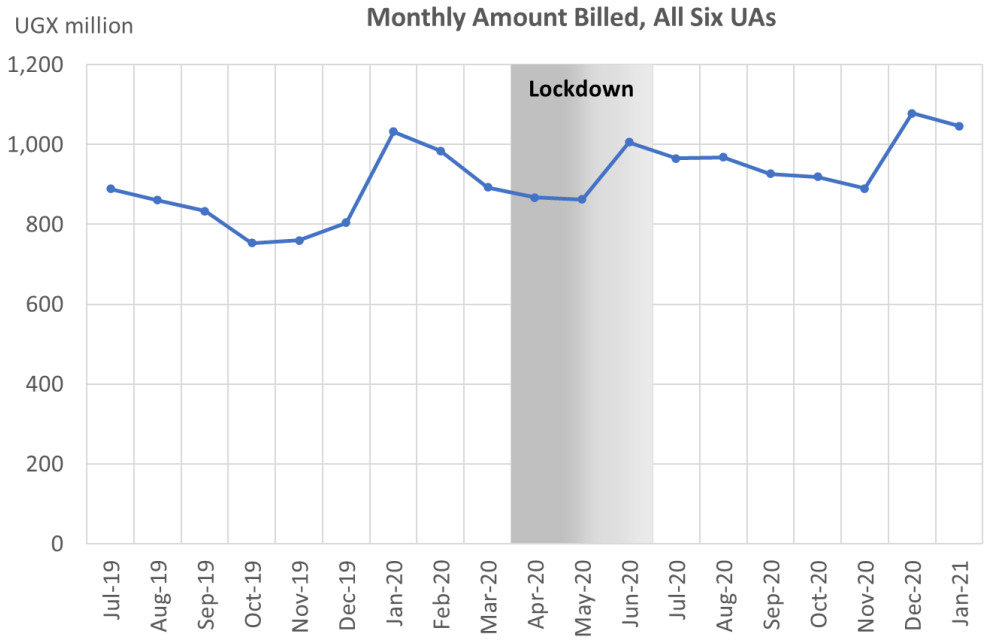


Fig. 4.1a – Monthly amounts billed, July 2019 to January 2021, all UAs combined

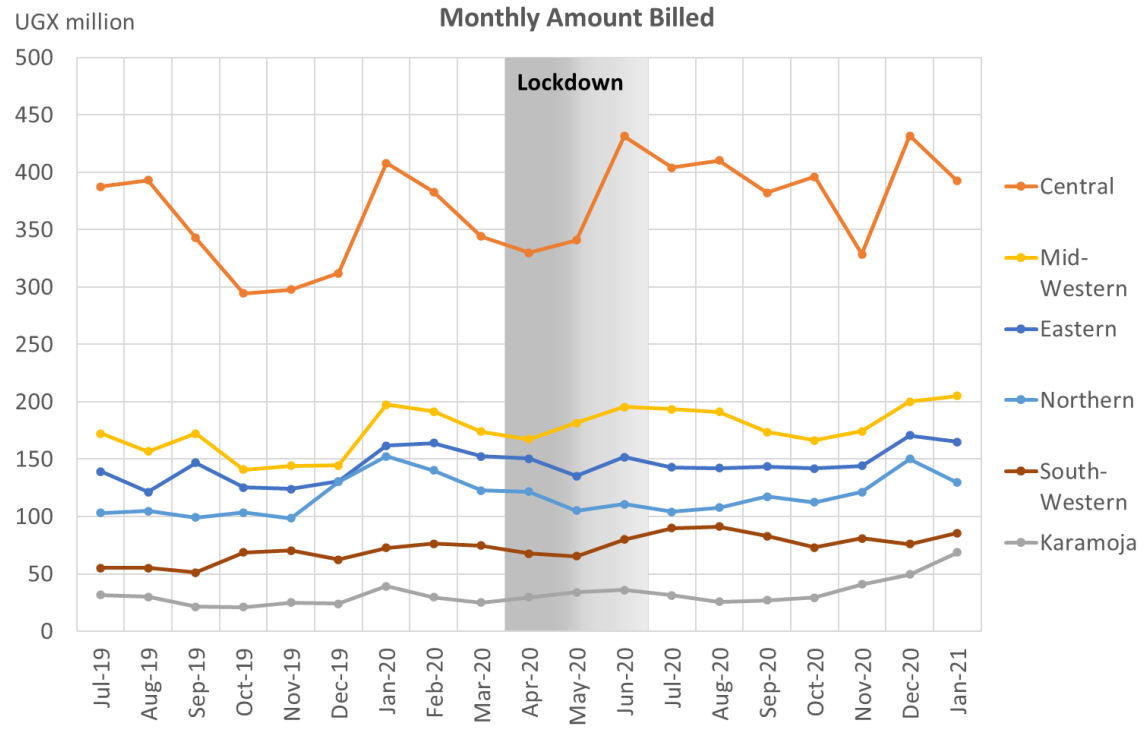


Fig. 4.1b – Monthly amounts billed, July 2019 to January 2021, by UA

Water distribution, consumption and billing continued almost normally during the lockdown period. In Central, there might be some delayed billing, causing the June peak, but lower water consumption during the rainy season (April-May) is a normal seasonal effect.

4.5 Financial Losses Due to the Lockdown

As described in the methodology section, the financial losses were estimated by comparing the actual revenue collections to the collections that could have been expected without the lockdown. The figures below visualise the revenue losses, first for all UAs combined and then for each of the UAs individually.

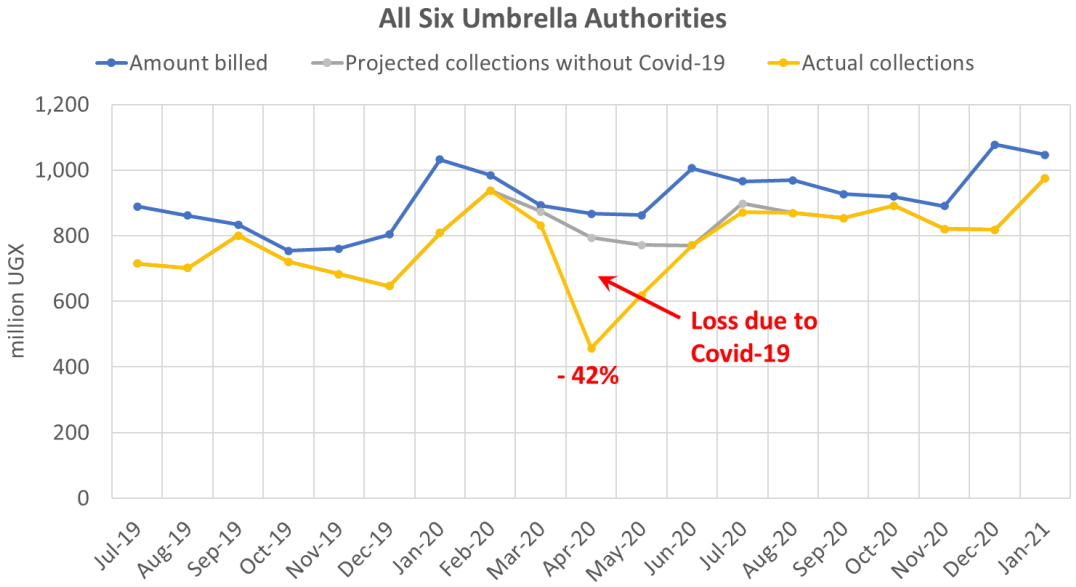


Fig. 4.2a – Revenue losses due to the Covid-19 lockdown, all UAs combined

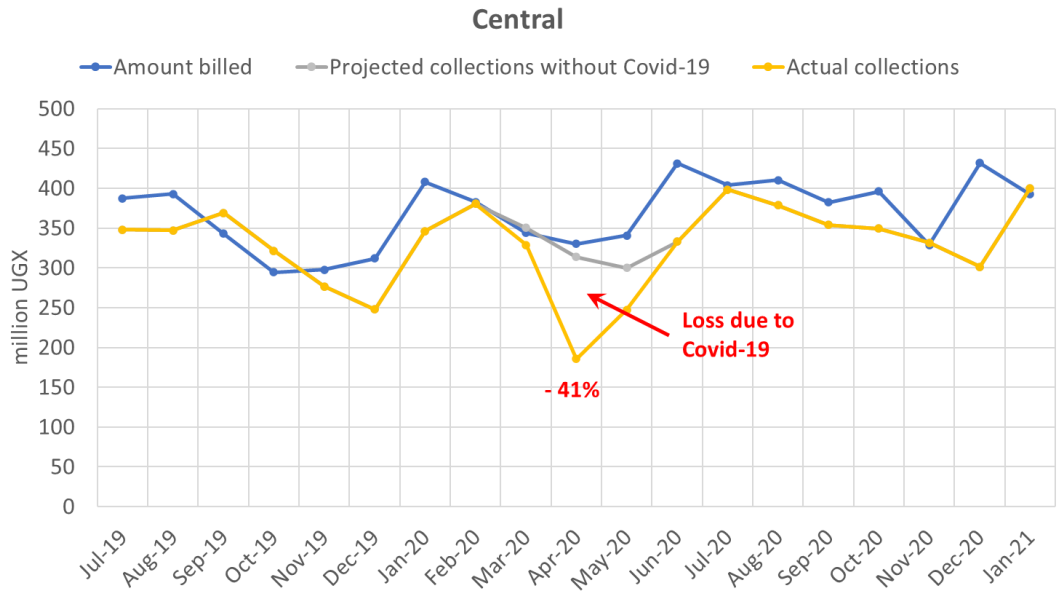
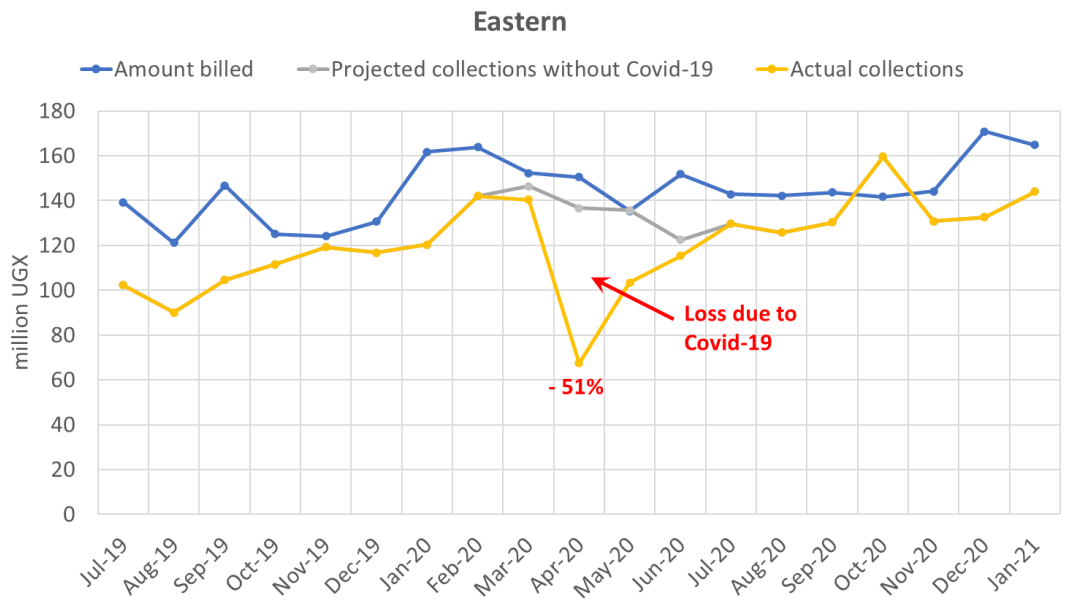
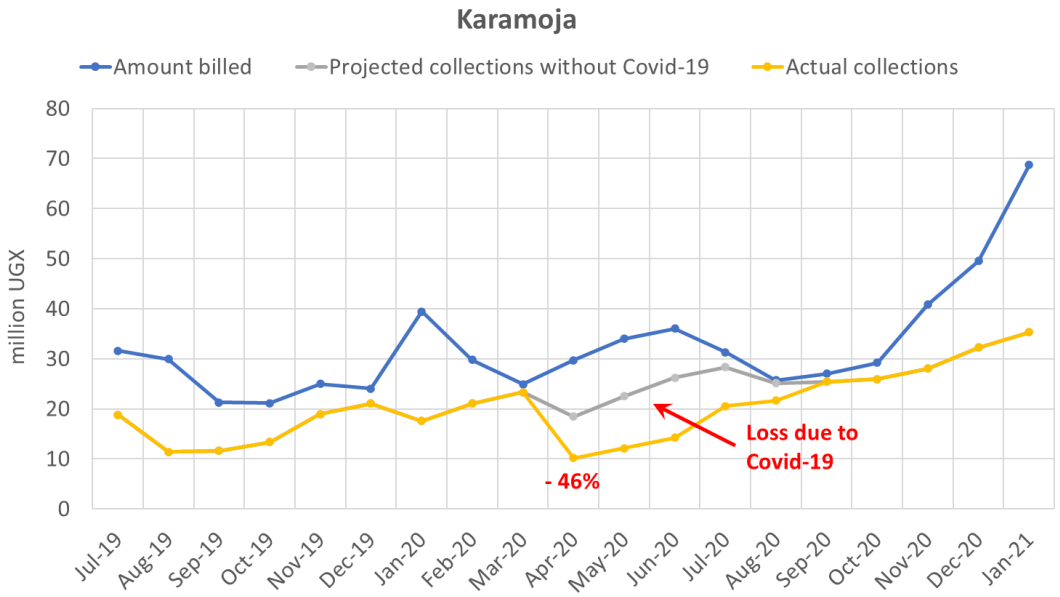
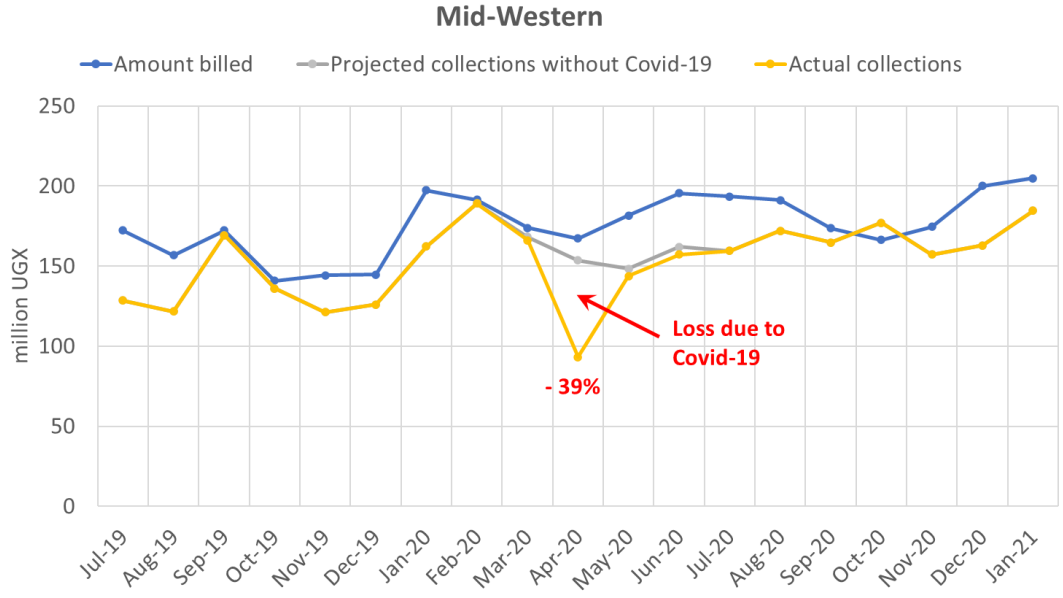


Fig. 4.2b – Revenue losses due to the Covid-19 lockdown, by UA

(continues on following pages)


Eastern
Amount billed
Projected collections without Covid-19
Actual collections
million UGX
180
160
140
120
100
80
60
40
20
0
Loss due to Covid-19
- 51%
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21


Karamoja
Amount billed
Projected collections without Covid-19
Actual collections
million UGX
80
70
60
50
40
30
20
10
0
Loss due to Covid-19
- 46%
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21


Mid-Western
Amount billed
Projected collections without Covid-19
Actual collections
million UGX
250
200
150
100
50
0
Loss due to Covid-19
- 39%
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21

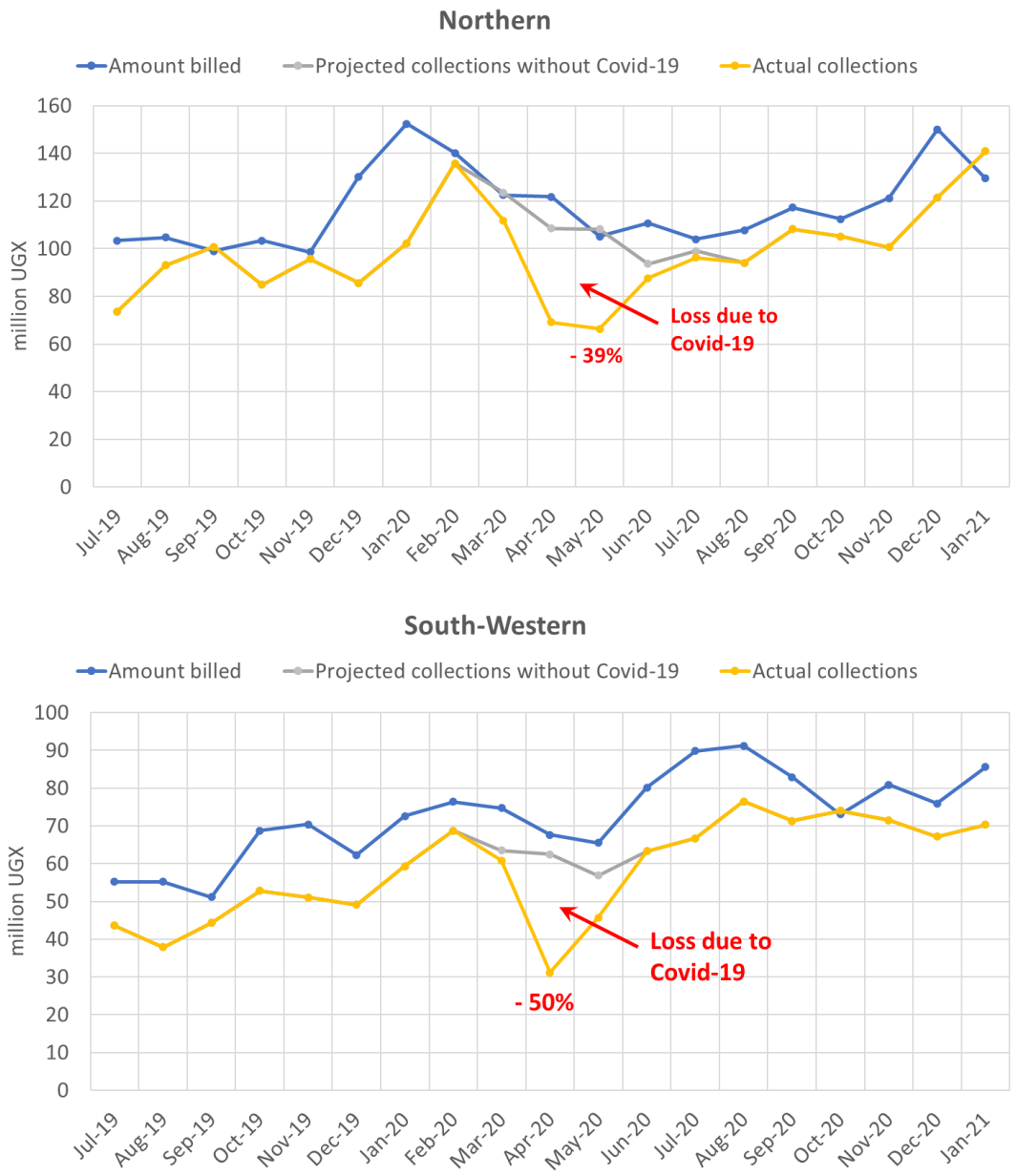


Fig. 4.2b – Revenue losses due to the Covid-19 lockdown, by UA

The pattern of financial losses is similar for each of the six UAs:

- In March 2020, the lockdown had still little impact as it began at the very end of the month.
- In April 2020, when a strict lockdown was in place during the entire month, revenue collections were about 40% to 50% lower than they would have been with normal collection efficiency.
- In May, the impact decreased in most regions and collections were only 20% lower than expected, except in the North (Northern UA and Karamoja) where the losses remained high.
- In June the collections were almost back to normal, except in Karamoja.

From July onwards the collection efficiency was close to the values before the lockdown. However, in general the unpaid bills of the lockdown period were not recovered.

Table 4.1 summarises the financial losses as percentages and in absolute figures.

Table 4.1 – Financial losses due to the Covid-19 lockdown

	Central	Eastern	Karamoja	Mid-Western	Northern	South-Western	All 6 UAs
Max. loss in April/ May 2020 as % of expected revenue	-41%	-51%	-46%	-39%	-39%	-50%	-42%
Total loss of March to June 2020 as % of the annual revenue	-5%	-7%	-10%	-4%	-8%	-6%	-6%
Total loss of April to June 2020 in UGX million	-203m	-115m	-31m	-72m	-99m	-45m	-564m

4.6 INTERPRETATION

The immediate impact of the lockdown ended after about three months. Revenue collection losses were dramatic in April/May 2020, but collections recovered quickly as the lockdown restrictions were being eased.

The overall impact on the UAs' annual revenue was therefore limited. The annual collections were between 4% and 10% lower than they would have been without Covid-19.

In absolute figures, this is equivalent to a loss of UGX 564 million for all UAs. In general, the arrears originating from the lockdown period could not be recovered later.

However, the above figures only reflect the direct impact of the lockdown period on collections. Other longer-term effects (e.g. due to a general economic slowdown) are not captured.

Apart from reduced revenue, it is likely that there are also impacts of the pandemic on O&M costs, for example due to reduced staff productivity or additional travelling (with fewer people in a car). However, there are no data to valuate such effects.

ANNEX – UTILITY PERFORMANCE DATA BY SCHEME

ANNEX 1 – CENTRAL UMBRELLA

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-tions	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced	Water billed (con-sumed)	NRW	Continuity of supply	% of micro-biol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
			UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima-tions)*	*calculated (italics: estim. involved)*	UPMIS *(italics: estim. from Pegasus)*	*Pegasus (italics: corr. from UPMIS)*	*calc. (italics: estim. involved)*	*UPMIS (italics: incomplete data)*	*UPMIS (incomplete data)*	*UPMIS (italics: Q2 report)*	*Pegasus and UPMIS*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*estimated from Q2 report and perf. sheet*	*calculated from collec-tions and O&M costs*
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
	Total / Average		**542,743**			**18,986**	**100%**	**476**	***9,446***	**53%**	***5,262***	**3,184**	**39%**	**90%**	***79%***	**374**	**3,262**	**337.4**	**86%**	***240.4***	**118%**
1	Biiso	Buliisa	12,983	Grid/diesel	2,014	164	100%	19	120	93%	112	73	35%	89%		5	3,400	6.4	89%	3.7	159%
2	Bujenje	Masindi	3,600	Grid	2,003	216	100%	-	80	36%	29	22	25%	81%		2	3,400	2.6	90%	2.2	102%
3	Bujuko	Mpigi	10,000	Grid	2,009	84	100%	-	45	46%	21	16	23%		*50%*	2	3,400	1.8	91%	1.4	115%
4	Bukomansimbi	Bukomansimbi	15,250	Grid/diesel	2,004	568	100%	10	190	77%	147	87	40%	93%		8	3,400	9.9	84%	9.2	94%
5	Buliisa	Buliisa	7,677	Grid/diesel	2,007	80	100%	5	100	37%	37	30	19%	99%	*100%*	5	3,400	3.3	83%	2.1	131%
6	Busaana	Kayunga	1,230	Solar	2,016	12	100%	2	14	86%	12	9	25%	*98%*	*0%*	1	1,695	0.5	56%	0.2	145%
7	Busiika	Luwero		Grid		487	100%	8	*98*	*100%*	*98*	*44*	55%	*83%*		10	3,400	3.7	103%	2.7	136%
8	Busunju	Mityana	20,000	Grid	2,008	350	100%	4	168	75%	126	67	47%	*97%*	*100%*	5	3,400	7.3	89%	5.0	127%
9	Butemba-Bukwiri	Kyankwanzi	12,800	Grid/solar		5	100%		*50*		*40*	25		*100%*		2	2,120	1.6	69%	0.6	183%
10	Butenga-Kawoko	Bukomansimbi				525	100%	20	480	*32%*	*155*	*94*				9	3,400	10.4			
11	Butiaba	Buliisa	7,000	*Gravity/grid*	2,007	286	100%	38	300	35%	105	86	19%	*94%*		10	3,400	7.9	92%	5.5	127%
12	Buvuma	Buvuma	1,656	Solar/diesel	2,017	150	100%	5	120	51%	62	30	51%	97%		4	2,050	2.1	76%	1.3	121%
13	Bwijanga	Masindi	4,500	Grid	2,007	92	100%	2	25	37%	9	7	20%	83%		1	3,400	0.9	66%	0.4	143%
14	Jezza	Mpigi	9,900	Grid	2,014	338	100%	21	150	73%	110	71	36%	*96%*	*67%*	5	3,400	7.7	89%	5.3	133%
15	Kabango	Masindi	25,000	Grid/diesel	2,015	426	100%	13	120	59%	70	*57*	19%	80%		8	3,400	6.8	77%	4.8	116%
16	Kakooge	Nakasongola	8,874	Grid/diesel	2,011	512	100%	6	576	33%	*189*	*123*	*35%*	*99%*		7	3,400	14.6	77%	8.7	143%
17	Kakyanga	Kyotera	2,600	Grid/diesel	2,014	162	100%	6	60	*38%*	*23*	14		*85%*		2	3,400	1.6	67%	1.2	82%
18	Kalagi-Kabembe	Mukono	25,075	Grid/diesel	2,018	2,020	100%	32	768	49%	379	244	36%	84%	*80%*	18	3,400	27.7	86%	24.1	98%
19	Kalungi	Nakasongola	1,200	Solar		24	100%	5	40	*14%*	*6*	3		*100%*		3	3,400	0.3	64%	0.2	128%
20	Kamengo	Mpigi	8,788	Grid	2,016	302	100%	4	300	64%	193	*93*	52%	93%		7	3,400	9.6	85%	6.0	139%
21	Kamuzinda	Masaka	9,200	Grid/diesel	2,015	149	100%	6	44	71%	31	26	17%	99%		3	3,400	2.6	89%	1.7	139%
22	Kangulumira	Kayunga	16,735	Grid/diesel	2,006	638	100%	3	*131*	*100%*	131	104	21%	95%	*100%*	8	3,400	11.6	93%	7.0	154%
23	Kanjuki	Kayunga	1,500	Solar	2,016	42	100%	3	16	116%	19	11	39%	*97%*	*0%*	1	1,695	0.6	69%	0.3	144%
24	Kasana	Kayunga				101	100%	-	*22*	80%	17	13	23%	*95%*		3	3,400	1.5	74%		
25	Kasanje	Wakiso	13,452	Grid/diesel	2,013	801	100%	5	*175*	101%	177	91	49%	89%	*100%*	8	3,400	10.6	76%	7.0	114%
26	Kasensero	Kyotera	5,220	Grid/diesel	2,014	223	100%	11	150	30%	*45*	23	50%	*85%*		3	3,400	2.6	73%	1.7	109%
27	Katende	Mpigi	5,689	Grid	2,016	293	100%	4	*112*		*112*	*68*		*92%*		8	3,400	7.4	93%	7.1	104%
28	Katugo	Nakasongola	3,800	Grid/diesel	2,016	254	100%	5	54	92%	*49*	31	*38%*	*69%*		5	3,400	3.7	95%	3.2	112%
29	Kawuku	Kayunga	1,300	Solar	2,016	10	100%	2	20	77%	15	13	17%	*97%*	*100%*	1	1,695	0.5	70%	0.3	144%
30	Kayunga	Kayunga	*26,588*	Grid/diesel	2,002	1,030	100%	-	370	85%	313	*197*	37%	91%	*67%*	14	3,400	24.6	78%	19.4	98%

ANNEX 1 – CENTRAL UMBRELLA *(CONTINUED)*

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-	% metered	Public water	Installed Capacity	System capacity	Water produced	Water billed (con-	NRW	Continuity of supply	% of micro-biol. tests	Staff number	Tariff (excl.	Monthly billing	Collection efficiency	Monthly operation	Operating cost coverage
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
31	Kazwama	Kyankwanzi	3,800	Solar		8	100%	3	30	*32%*	*10*	6		*97%*	*100%*	2	1,695	0.3	73%	0.1	144%
32	Kiboga	Kiboga	20,000	Grid/diesel	1,998	891	100%	24	300	92%	276	158	43%	94%		12	3,400	17.4	93%	12.7	126%
33	Kibuye	Nakasongola			2,013	17		5	40	*38%*	*15*	9		*98%*		2	2,500	0.7	88%	0.3	183%
34	Kikyusa	Mpigi	10,879	Grid/diesel		591	100%	10	220	*73%*	*162*	99		74%		11	3,400	10.0	90%	6.8	129%
35	Kiryokya	Mityana				39			*17*		*14*	8				*4*	3,400	0.8	30%	-	
36	Kituntu	Mpigi	2,500	Solar		16			*63*		*50*	31		*95%*		*3*	1,695	1.3	122%	0.8	183%
37	Kiwoko-Butalangu	Nakaseke		Grid	2,019	679	100%	5	*1,040*	19%	194	68	65%	88%		8	3,400	7.7	86%	3.7	177%
38	Kiyindi	Buikwe		Grid		12	100%	18	*15*		*15*	9		*96%*	*0%*	*2*	3,400	0.6	79%	0.4	118%
39	Kyamulibwa	Kalungu	6,689	Grid/diesel	2,015	566	100%	14	240	55%	132	84	36%	95%		*9*	3,400	9.2	88%	7.6	125%
40	Kyatiri	Masindi	4,987	Grid	2,006	139	100%	3	*27*	*100%*	27	21	22%	84%		3	3,400	2.3	71%	1.2	126%
41	Lwamaggwa	Rakai		Solar		244			*26*		*21*	13		*95%*		*6*	3,400	1.6	68%	1.3	80%
42	Lwanda	Kyotera	15,000	Grid/diesel		420	100%	4	288	39%	112	44	61%	93%		5	3,400	5.1	84%	4.0	111%
43	Masulita	Wakiso	10,560	Grid		144	100%	7	*44*	*100%*	*44*	39	*10%*	*95%*	*100%*	2	3,400	3.9	91%	3.9	87%
44	Matale	Buikwe	5,024	Grid/solar	2,017	108	100%	17	153	38%	58	32	46%	*97%*	*0%*	10	2,545	2.5	87%	1.6	149%
45	Migeera-Nabiswera	Nakasongola	11,000	Grid/diesel	2,008	347	100%	6	180	72%	129	78	40%	*99%*		6	3,400	8.7	87%	6.0	125%
46	Najja	Buikwe				12			*15*		*12*	7				*3*	2,120	0.5	74%		
47	Nakawuka	Wakiso	15,987	Grid	2,004	200	100%	5	*106*	*100%*	106	53	50%	98%		5	3,400	5.6	87%	4.4	119%
48	Nakifuma	Mukono	21,250	Grid	2,007	241	100%	3	*129*	*100%*	*129*	52	*60%*	*81%*	*67%*	6	3,400	5.7	89%	4.6	106%
49	Nakirubi	Kayunga	2,345	Solar	2,017	1	100%	2	*13*	*100%*	13	11	13%	100%	*100%*	3	1,270	0.4	96%	0.3	181%
50	Namasumbi	Mukono				47			*6*		*5*	3				*4*	3,400	0.4	37%		
51	Namayumba	Wakiso	5,300	Solar/diesel	2,008	180	100%	3	91	36%	32	21	34%	89%	*80%*	3	3,400	2.5	80%	1.0	183%
52	Namulonge-Kiwenda	Wakiso	16,367	Grid/diesel		1,460	100%	13	460	76%	*348*	*209*	*40%*	*95%*		16	3,400	23.5	91%	21.1	113%
53	Nangulwe	Buikwe	2,700	Gravity	2,006	58	100%	4	60	*47%*	*28*	17		99%	*0%*	10	2,120	1.2	75%	0.6	145%
54	Nangunga	Buikwe	2,500	Solar		18	100%	7	10	*100%*	*10*	6			*100%*	*10*	2,775	0.5	84%	0.3	137%
55	Nazigo	Kayunga	11,019	Grid	2,012	103	100%	4	100	28%	28	19	35%	96%	*0%*	4	3,400	2.1	93%	1.5	130%
56	Ngwedo	Buliisa	800	Solar	2,013	4	100%	4	10	78%	8	*7*	17%	87%	*100%*	1	2,120	0.5	85%	0.2	183%
57	Nkoni	Lwengo	12,500	Grid/diesel	2,014	703	100%	13	192	66%	*126*	91	*28%*			8	3,400	10.2	95%	8.0	125%
58	Ntenjeru	Kayunga	2,000	Solar	2,016	25	100%	2	8	105%	8	5	35%	*97%*	*0%*	2	1,695	0.3	45%	0.1	140%
59	Ntwetwe	Kyankwanzi	11,000	Grid/diesel	2,013	498	100%	7	100	*100%*	*108*	66		*89%*		6	3,400	7.1	82%	5.1	111%
60	Sekanyonyi	Mityana	*12,500*	Grid/diesel		284	100%	18	250	24%	61	50	18%	*72%*	*75%*	6	3,400	5.7	79%	5.5	84%
61	Ssenyi	Buikwe	5,720	Gravity		54	100%	-	*75*		*75*	45		100%	*50%*	*7*	1,230	1.8	86%	1.1	137%
62	Ssi	Buikwe	4,338	Solar		77	100%	19	32	56%	18	14	25%	99%	*100%*	13	2,545	1.1	79%	0.6	145%
63	Suuka	Kayunga	5,000	Solar	2,016	28	100%	3	10	73%	7	7	6%	100%		4	1,695	0.4	95%	0.2	155%
64	Wanseko	Buliisa		Diesel	2,007	18	100%	4	50	17%	9	*7*	18%	74%	*100%*	2	3,400	0.9	73%	0.6	153%
65	Zigoti	Mityana	7,361	Grid/diesel	2,018	410	100%	10	150	*26%*	*40*	24		*100%*	*100%*	8	3,400	3.1	87%	2.9	99%
	Schemes still in takeover process as of December 2020																				
	Bamunanika	Luwero				431															
	Buyamba	Rakai				269															
	Kirokola	Butambala				228															

ANNEX 2 – EASTERN UMBRELLA

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-tions	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced	Water billed (con-sumed)	NRW	Continuity of supply	% of micro-biol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
			UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima-tions)*	*calculated (italics: estim. involved)*	UPMIS *(italics: estim. from Pegasus)*	*Pegasus (italics: corr. from UPMIS)*	*calc. (italics: estim. involved)*	*UPMIS (italics: incomplete data)*	*Quarter 2 report (incomplete data)*	*UPMIS*	*Pegasus and UPMIS (italics: data issues)*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*UPMIS and Q2 report*	*calculated from collec-tions and O&M costs*
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
	Total / Average		**371,984**			**11,772**	**100%**	**155**	**12,681**	**21%**	***2,677***	**1,653**	**38%**	**90%**	***98%***	**168**	**2,209**	**128.4**	**81%**	**91.0**	**111%**
1	Bubwaya	Manafwa	15,000	Solar	2,014	76	100%	2	48	13%	*6*	4		*80%*		2	2,050	0.4	50%	0.2	74%
2	Budaka	Budaka	18,489	Grid	2,002	*196*	100%	-	408	20%	80	53	34%	91%		5	2,542	4.5	99%	4.3	100%
3	Bududa-Nabweya	Bududa	12,000	Gravity		1,715	100%	-	1,900	8%	*160*	*99*		79%		12	2,050	8.4	56%	3.8	120%
4	Bukwo	Bukwo	10,000	Gravity	2,005	950	100%	7	3,000	9%	*266*	165		*100%*		14	1,000	7.9	42%	3.6	88%
5	Bulegeni	Bulambuli	14,570	Gravity	2,003	671	100%	9	1,000	10%	*104*	65		*83%*	*100%*	7	1,640	4.3	85%	2.4	146%
6	Bulopa	Kamuli	10,000	Grid		238	100%	3	144	25%	37	25	31%	*92%*		5	3,000	2.7	77%	1.7	117%
7	Bulumba	Kaliro	14,567	Grid	2,008	40	80%	-	40	14%	*6*	*4*	*23%*	*91%*	*100%*	2	2,542	0.4	91%	0.5	68%
8	Busolwe	Butaleja	12,000	Grid	2,001	210	100%	2	45	86%	39	*19*	51%	86%	*100%*	3	2,542	1.7	99%	1.4	122%
9	Buwoya-Buboko	Namayingo		Solar		120	100%	1	521	4%	23	5	76%	*100%*	*75%*	3	*3,400*	0.8	52%	0.5	90%
10	Buyende	Buyende	7,000	Solar/diesel		476	100%	7	236	38%	89	62	30%	*99%*	*100%*	5	2,542	5.4	97%	4.0	132%
11	Gweri	Soroti	6,733	Solar	2,014	29	100%	4	64	14%	9	8	12%	*99%*	*100%*	2	2,542	0.8	71%	0.6	91%
12	Irundu	Buyende	8,000	Solar	2,015	200	100%	3	240	23%	56	*41*	27%	97%	*100%*	5	*2,119*	1.8	125%	1.6	139%
13	Iziru-Busedde	Jinja	1,000	Grid	2,017	721	100%	6	*272*	42%	113	80	29%	89%	*100%*	7	2,542	7.2	90%	5.8	109%
14	Kapelebyong	Amuria	*13,600*	Solar		193	100%	3	272	16%	43	28	36%	100%		5	2,119	2.1	89%	1.1	167%
15	Kasambira	Kamuli	16,560	Grid	2,007	558	100%	9	240	36%	88	*67*	23%	98%	*100%*	6	2,419	5.3	82%	3.6	117%
16	Kasilo-Kamod	Serere	3,455	Solar	2,015	86	100%	2	72	60%	43	*15*	66%	*97%*		3	2,119	0.5	131%	0.7	99%
17	Katakwi	Katakwi	11,842	Solar	2,014	577	100%	5	486	34%	167	*114*	31%	96%	*100%*	8	2,542	9.2	79%	6.5	109%
18	Kibuku-Tirinyi	Kibuku	18,251	Grid	2,010	368	100%	4	336	52%	173	*79*	54%	92%	*100%*	8	*2,542*	6.7	64%	4.1	101%
19	Kyere	Serere	10,253	Grid		185	100%	6	90	47%	42	*23*	44%	97%		3	*2,542*	2.3	71%	1.6	99%
20	Magoro	Katakwi	4,349	Grid	2,013	86	100%	2	64	59%	*38*	10	*73%*	*100%*	*100%*	1	*2,000*	1.2	38%	0.5	93%
21	Masafu	Busia	18,738	Grid	2,010	386	100%	7	176	48%	84	70	17%	87%	*100%*	5	2,542	6.1	96%	4.4	131%
22	Mukongoro	Kumi	14,324	Grid		134	100%	4	*79*	*100%*	79	26	67%	*92%*	*0%*	4	2,542	2.3	87%	1.7	115%
23	Muyembe	Bulambuli	2,000	Grid	2,007	121	100%	4	112	11%	*13*	*8*		*91%*		4		1.3	38%	1.0	49%
24	Namagera	Jinja	1,000	Grid		421	100%	11	256	36%	92	*59*	36%	*94%*	*100%*	5	2,542	4.6	95%	3.9	109%
25	Namayingo	Namayingo	*24,000*	Grid		394	100%	5	480	19%	89	64	28%	*100%*	*100%*	5	*2,861*	6.1	91%	6.4	84%
26	Namutumba	Namutumba	18,736	Grid	2,010	856	100%	8	400	64%	256	158	38%	*78%*	*100%*	8	2,542	13.4	91%	9.5	125%
27	Namwendwa	Kamuli	10,000	Grid	2,008	346	100%	10	112	51%	57	47	16%	*80%*	*100%*	5	2,542	4.4	83%	3.4	105%
28	Namwiwa	Kaliro	12,334	Solar		203	100%	1	216	17%	36	30	17%	*100%*		3	2,119	2.3	76%	1.3	129%
29	Nankoma	Bugiri	18,750	Grid	2,007	135	100%	5	192	21%	40	36	9%	*99%*	*100%*	3	2,542	2.9	95%	2.5	109%
30	Ocapa	Serere	3,000	Grid	2,010	342	100%	8	336	40%	133	43	67%	88%		5	2,542	3.8	87%	3.2	102%
31	Ochero	Kaberamaido	*13,600*	Grid	2,015	144	100%	3	272	15%	42	18	56%	88%		3	2,542	1.6	91%	1.6	91%
32	Ongino	Kumi	*8,000*	Solar		193	100%	3	160	17%	*27*	*17*	*37%*	*96%*	*100%*	5	2,118	1.1	85%	1.0	95%
33	Suam	Bukwo	10,960	Gravity	2,015	281	100%	3	330	33%	*108*	84	*22%*	*98%*		3	1,000	3.1	79%	1.7	140%
34	Toroma (Katakwi)	Katakwi	2,073	Solar	2,014	86	100%	4	34	69%	*23*	15		*100%*	*100%*	2	1,700	0.9	81%	0.7	106%
35	Usuk	Katakwi	1,800	Grid	2,013	35	100%	4	48	32%	*16*	*10*		*100%*		2	1,700	0.6	72%	0.5	86%
	Schemes still in takeover process as of December 2020																				
	Nambale	Mbale	1,750	Gravity	2,003	49	92%	15	48							2					

ANNEX 3 – KARAMOJA UMBRELLA

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-tions	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced	Water billed (con-sumed)	NRW	Continuity of supply	% of micro-biol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
			UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS*	calculated	UPMIS	*Pegasus (italics: corr. from UPMIS)*	*calc.*	*UPMIS (italics: incomplete data)*	*UPMIS WQ report*	*UPMIS*	*Pegasus and UPMIS*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*UPMIS*	*calculated from collec-tions and O&M costs*
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
	Total / Average		**176,702**			**2,064**	**100%**	**77**	**2,381**	**23%**	**597**	**421**	**30%**	**90%**	**83%**	**25**	**2,419**	**34.3**	**56%**	**18.7**	**97%**
1	Abim	Abim	24,086		2,014	527	100%	3	480	14%	67	*37*	46%	80%	100%	3	2,543	2.97	60%	4.1	45%
2	Alerek	Abim	6,834	Solar	2,013	89	100%	4	51	49%	25	8	66%	99%	100%	1	2,119	0.54	73%	0.3	154%
3	Amudat	Amudat	14,812	Solar	2,020	242	100%	5	216	25%	55	38	31%	99%	100%	3	2,543	2.95	64%	1.1	169%
4	Chesabun-Moruita	Nakapiripirit	1,997	Solar	2,013	16	100%	3	32	22%	7	*5*	31%	*67%*		1	2,119	0.28	14%	*0.1*	78%
5	Kacheri	Kotido	8,827	Solar		70	100%	4	48	39%	19	*15*	19%	98%	63%	1	2,119	*0.95*	61%	0.6	93%
6	Kapedo	Kaabong	2,369	Solar	2,014	46	100%	5	32	90%	29	*24*	15%	100%	50%	1	2,119	1.80	49%	0.4	213%
7	Karenga	Kaabong	8,853	Solar	2,014	249	100%	3	192	31%	59	*51*	13%	95%	50%	2	2,119	3.72	80%	3.3	89%
8	Loroo	Amudat	10,245	Solar	2,014	7	100%	5	24	24%	6	4	38%	100%	33%	1	2,119	*0.23*	55%	0.1	127%
9	Morulem	Abim	7,581	Solar	2,017	47	100%	4	80	13%	10	3	71%	70%	75%	1	2,119	*0.19*	55%	0.2	48%
10	Nabilatuk	Nakapiripirit	8,128	Solar	2,015	70	100%	11	120	35%	42	*27*	36%	91%	100%	1	2,500	2.35	43%	0.7	134%
11	Nadunget	Moroto	9,884	Solar	2,017	36	100%	4	40	81%	32	*26*	21%	99%	25%	1	2,119	2.48	7%	0.2	159%
12	Nakapelimoru	Kotido	23,552	Solar	2,018	37	100%	11	100	39%	39	*33*	14%	100%		1	2,543	4.64	35%	0.7	253%
13	Nakapiripirit	Nakapiripirit	6,486	Grid	2,017	237	100%	4	480	16%	78	*49*	36%	95%	75%	3	2,966	5.93	54%	3.0	102%
14	Namalu	Nakapiripirit	20,770	Grid	2,015	163	100%	2	270	16%	43	31	28%	82%	75%	2	2,200	2.06	79%	2.7	59%
15	Orwamuge	Abim	13,221	Solar	2,020	203	100%	-	120	56%	67	*55*	18%	95%	100%	1	2,543	2.57	67%	0.9	193%
16	Rengen	Kotido	9,057	Solar	2,014	25	100%	9	96	20%	19	*15*	21%	82%	0%	2	2,119	0.65	107%	0.4	159%

Schemes still in takeover process as of December 2020

	Alakas	Amudat	3,086	Solar	2,017	5	100%	3	24	*6%*		*1*		*100%*	0%	1	2,119				
	Kopoth	Kaabong	8,303	Solar	2,016	8	100%	10	54	*3%*		*1*		*51%*		1	2,119				
	Lokolia	Kaabong	1,411	Solar	2,018	18	100%	16	112	*3%*		*2*		100%	100%	1	2,119				
	Lolachat	Nakapiripirit	5,665	Solar	2,018	21	100%	9	54	*74%*		*28*		100%	0%	1	2,119				
	Longariama	Napak	192	Solar	2,016	2	0%	1	24					100%			2,119				
	Lopei	Napak	2,500	Solar	2,017	8	100%	8	40	*7%*		*1*		78%	50%	1	2,119				
	Lorengecora	Napak																			
	Lorukumo	Moroto	5,354	Solar	2,017	4	0%	2	32					100%	33%	1	2,119				

Schemes gazetted for management by the Karamoja UA but currently non-functional (to be rehabilated before takeover)

Scheme name	District	Pop. served	Energy source	Year of constr.
Kakingol	Moroto	1,784	Gravity	2,010
Kalapata	Kaabong	500	Solar	2,012
Karita	Amudat		Solar	
Kathile	Kaabong	5,500	Solar	2,016
Kodike	Napak	3,512	Gravity	1,998

Scheme name	District	Pop. served	Energy source	Year of constr.
Lokitalaebu	Kotido	6,429	Solar	2,013
Lolelia	Kaabong	250	Solar	2,017
Lorengedwat	Nakapiripirit	2,000	Solar	2,012
Lorukumo	Nakapiripirit	1,000	Solar	2,008
Michoko	Napak	9,083	Gravity	2,000

Scheme name	District	Pop. served	Energy source	Year of constr.
Nadiket	Moroto	8,776	Gravity	2,010
Panyangara	Kotido	4,700	Solar	2,013
Tokora	Nakapiripirit	3,000	Solar	2,015

ANNEX 4 – MID-WESTERN UMBRELLA

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-tions	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced	Water billed (con-sumed)	NRW	Continuity of supply	% of microbiol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
			UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima-tions)*	*calculated (italics: estim. involved)*	UPMIS *(italics: estim. from Pegasus)*	*Pegasus (italics: corr. from UPMIS)*	*calc. (italics: estim. involved)*	*UPMIS (italics: incomplete data)*	*UPMIS WQ report*	*UPMIS (italics: esti-mated)*	*Pegasus and UPMIS (italics: data issues)*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*UPMIS and Q2 report*	*calculated from collec-tions and O&M costs*
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
	Total / Average		**488,884**			**12,659**	**91%**	**720**	***14,128***	**22%**	***3,152***	**2,089**	**34%**	**96%**	**82%**	**158**	**2,412**	**164.1**	**85%**	***95.1***	**141%**
1	Biguli	Kamwenge	17,256	Diesel/solar	2,015	215	100%	6	*66*	*100%*	66	58	12%	100%	100%	6	*2,870*	4.4	89%	3.4	112%
2	Bitojo	Kamwenge	5,973	Grid/diesel		148	100%	12	312	12%	38	*19*	49%	98%	100%	3	*2,820*	1.3	82%	0.4	234%
3	Buhesi	Bunyangabu	20,580	Gravity	2,001	392	84%	42	*125*	80%	*100*	60	*40%*	98%	0%	3	1,000	2.6	77%	1.8	106%
4	Buhimba (Hoima)	Hoima	8,700	Grid	2,014	163	100%	5	312	9%	28	23	20%	100%	100%	2	3,390	2.4	94%	2.4	88%
5	Bukuya	Mubende	12,184	Grid	2,015	290	100%	24	180	63%	113	*92*	19%	96%	100%	3	3,000	8.8	90%	3.3	233%
6	Bulyango	Hoima	3,200		2,006	102		18	*72*	7%	*5*	3			0%	*1*	unmetered	0.5			
7	Bundibugyo	Bundibugyo	4,528	Gravity	1,996	800	67%	12	500	31%	*156*	138	*11%*	79%	88%	10	*2,870*	12.4	64%	4.5	172%
8	Businge-Buhumuriro	Kamwenge	1,896	Grid/diesel	2,016	27	100%	5	72	8%	6	*5*	20%	98%		1	*2,870*	0.2	95%	0.2	86%
9	Butema	Kasese	3,025	Grid/diesel		19	100%	4	*12*		9	9	7%	99%	100%	1	*2,500*	0.5	113%	0.3	169%
10	Butiiti	Kyenjojo	3,204	Gravity	1,996	94	100%	4	56	63%	*35*	23		99%	100%	1	*1,500*	1.2	89%	0.6	186%
11	Kabale	Kamwenge	9,056	Grid/diesel		361	100%	26	520	16%	84	8	90%	100%	100%	7	2,870	0.7	82%	0.4	140%
12	Kabasekende	Kibaale	1,357	Solar		102	100%	12	216	12%	*26*	23	*13%*	*100%*	100%	3	3,000	1.9	88%	0.9	172%
13	Kabuye (Biguli)	Kamwenge		Grid/diesel		267						26					2,870	2.3	91%	0.4	504%
14	Kabwoya	Hoima	2,679	Grid/diesel		165	100%	9	*1,200*	4%	44	37	*16%*	100%	100%	2	*3,390*	3.3	96%	3.3	94%
15	Kaihura	Kyenjojo	7,750	Gravity	2,013	337	100%	11	*143*	*100%*	143	93	35%	100%	100%	4	*1,500*	4.8	88%	1.9	216%
16	Kakabara	Kyegegwa	3,450	Grid/diesel	2,007	92	100%	11	195	19%	37	*25*	32%	99%	100%	2	3,000	2.3	89%	1.4	139%
17	Kakumiro	Kakumiro	17,920	Grid	2,015	638	100%	17	1,200	9%	113	89	22%	93%	100%	5	3,390	9.7	91%	6.7	135%
18	Kampala-Bigyere	Kamwenge				302			*25*		*20*	13					2,870	1.5	40%		
19	Kanyegaramire	Kyenjojo	10,600			46	100%	14	*13*		10	8	17%	95%	100%	1	*2,500*	0.5	85%	1.0	40%
20	Kanyogoga	Mubende	4,095	Grid		95	100%	7	*22*	*100%*	22	15	32%	*97%*	0%	2	3,390	1.6	71%	0.7	161%
21	Karugutu-Kithoma	Ntoroko	7,341	Gravity	2,000	337	100%	2	*212*		*170*	116	*32%*	100%	22%	4	1,500	5.8	96%	1.9	279%
22	Kasambya	Mubende	28,085	Grid	2,004	280	100%	7	240	41%	99	72	27%	95%	100%	6	3,390	7.1	98%	4.5	149%
23	Kasenda	Kabarole	9,152	Diesel	2,007	132	100%	25	240	23%	55	33	41%	100%	40%	3	3,390	2.4	95%	1.4	156%
24	Kassanda	Mubende	22,000	Grid	2,006	439	100%	17	270	42%	112	*88*	21%	94%	100%	7	3,390	9.2	95%	5.1	168%
25	Kayinja	Kamwenge	18,669	Gravity	2,018	430	100%	21	259	100%	259	51	80%	100%	100%	2	2,050	3.6	83%	1.5	196%
26	Kazinga (Kyegegwa)	Kyegegwa	11,068	Diesel		88	100%	16	72	24%	17	15	10%	86%	100%	2	*3,000*	1.1	95%	1.7	62%
27	Kibaale	Kibaale	30,000	Grid/diesel	2,008	509	100%	4	893	11%	95	*75*	21%	92%	100%	8	3,000	7.5	96%	7.7	93%
28	Kicwamba	Kabarole	18,000	Gravity	2,003	462	32%	26	*31*		*25*	*17*		100%	43%	3	unmetered	2.2	44%	1.4	70%
29	Kigorobya	Hoima	6,750	Grid	2,007	148	100%	5	72	57%	41	35	16%	99%	100%	1	3,390	3.2	94%	1.3	231%
30	Kikandwa	Mubende	*5,279*			199	100%	10	272	5%	*15*	*14*	6%			3	3,000	3.3	43%	1.7	85%

ANNEX 4 – MID-WESTERN UMBRELLA *(CONTINUED)*

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-	% metered	Public water	Installed Capacity	System capacity	Water produced	Water billed (con-	NRW	Continuity of supply	% of microbiol.	Staff number	Tariff (excl. VAT)	Monthly billing	Collection efficiency	Monthly operation	Operating cost coverage
		-	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima-tions)*	*calculated (italics: estim. involved)*	*UPMIS (italics: estim. from Pegasus)*	*Pegasus (italics: corr. from UPMIS)*	*calc. (italics: estim. involved)*	*UPMIS (italics: incomplete data)*	*UPMIS WQ report*	*UPMIS (italics: esti-mated)*	*Pegasus and UPMIS (italics: data issues)*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*UPMIS and Q2 report*	*calculated from collec-tions and O&M costs*
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
31	Kinogozi	Hoima	6,200	Grid	2,014	150	100%	6	720	2%	*17*	14	*20%*	99%	100%	1	3,390	1.6	83%	0.5	256%
32	Kitabu	Kasese	5,430	Gravity	2,001	16		11	*120*	*1%*	*1*	1			0%	*1*	unmetered	0.1	71%	0.6	11%
33	Kitaleesa	Kyegegwa	4,000	Diesel	2,014	89	100%	10	168	10%	18	15	15%	85%	100%	2	3,390	1.5	91%	1.2	118%
34	Kyakatwanga	Kibaale	1,140	Solar		29	100%	10	200	5%	9	8	12%	98%	100%	1	3,000	0.6	76%	0.1	380%
35	Kyamutunzi	Kyenjojo	5,000	Grid/diesel	2,008	90	100%	7	240	11%	27	19	27%	*100%*	100%	1	3,000	1.7	81%	1.0	138%
36	Kyarusozi	Kyenjojo	10,251	Grid/diesel	2,010	579	100%	13	156	74%	115	96	17%	100%	100%	3	2,050	6.7	92%	3.5	169%
37	Kyaterekera	Kagadi	4,739	Pumping		120	100%	8	240	26%	61	24	61%	*90%*	100%	2	3,000	2.2	60%	2.0	65%
38	Mabale	Kagadi	18,000	Grid/diesel	2,007	150	100%	9	126	40%	51	38	25%	95%	100%	2	*3,000*	3.4	104%	2.9	119%
39	Mahyoro	Kamwenge	4,525	Solar/diesel	2,002	181	100%	11	240	21%	51	31	39%	97%	100%	2	2,000	2.1	87%	1.8	99%
40	Malere	Kamwenge	1,389	Grid/diesel	2,016	16	100%	5	144	5%	7	*5*	36%	99%	100%	1	2,870	0.2	92%	0.6	30%
41	Malere 2	Kamwenge	*10,821*			421			*38*		*30*	20				*5*	*2,870*	2.0	54%		
42	Muhokya	Kasese	5,000	Gravity	1,999	194		59	*10*		*8*	5			0%	*1*	unmetered	0.8	37%	0.4	70%
43	Muhorro	Kagadi	23,000	Grid/solar	2,007	167	100%	4	45	87%	39	30	23%	65%	100%	2	3,000	3.0	94%	2.6	104%
44	Mukunyu	Kyenjojo	5,000	Gravity		161	100%	3	98	47%	*46*	30		98%	75%	2	1,500	1.6	90%	0.7	198%
45	Nalweyo	Kakumiro	3,358	Grid/diesel		33	100%	3	192	7%	*13*	11	*15%*			2	3,390	0.9	60%	0.9	59%
46	Ntandi	Bundibugyo	2,250	Gravity	2,004	164	0%	3	*11*		*9*	6		89%	11%	3	unmetered	1.4	75%	1.4	75%
47	Nyabitooma	Kamwenge	1,423	Gravity	2,004	585	100%	88	*196*		157	126	20%	100%	100%	3	1,000	4.7	88%	2.3	173%
48	Nyahuka	Bundibugyo	51,376	Gravity	2,016	912	100%	12	2,000	19%	376	239	36%	100%	100%	8	1,500	12.2	78%	3.2	281%
49	Nyamarunda	Kibaale	6,339	Grid/diesel	2,017	365	100%	16	600	5%	33	26	23%	94%	100%	5	3,390	3.1	83%	3.2	77%
50	Nyamarwa	Kibaale	4,690	Solar		34	100%	10	200	5%	9	8	12%	100%	100%	2	3,000	0.7	85%	0.7	76%
51	Pohe	Bunyangabu	2,409	Gravity		307	0%	27	*14*		*11*	9	*19%*	100%	0%	3	unmetered	1.3	60%	1.0	75%
52	Rugombe	Kyenjojo	6,400	Grid	2,007	46	100%	4	104	38%	40	14	65%	99%	100%	2	3,000	1.3	100%	1.2	102%
53	Rwebishahi	Kamwenge	1,164	Grid/diesel	2,016	51	100%	5	120	20%	24	*6*	74%	99%	100%	2	2,870	0.6	77%	0.2	197%
54	Rweihamba	Kabarole	8,603	Solar/diesel		58	100%	17	216	16%	35	12	67%	100%	100%	2	3,390	0.9	100%	0.7	119%
55	Rwembuba	Kakumiro				27			*21*		*17*	11				*2*	2,870	0.7	89%		
56	Rweteera	Bunyangabu	2,580	Pumping		35	100%	7	108	4%	*5*	*4*	*18%*		67%	2	3,390	0.6	66%	0.7	51%
	Schemes still in takeover process as of December 2020																				
	Katooke	Kyenjojo	14,782		2,003	79	87%	3	56							1	2,000				

ANNEX 5 – NORTHERN UMBRELLA

	Scheme name	Ref. settlement	District	Pop. served	Energy source	Year of constr.	Active connections	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced	Water billed (consumed)	NRW	Continuity of supply	% of micro-biol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
				UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estimations)*	*calculated (italics: estim. involved)*	UPMIS *(italics: estim. from Pegasus)*	*Pegasus (italics: corr. from UPMIS)*	*calc. (italics: estim. involved)*	*UPMIS (italics: incomplete data)*	*Data not available in UPMIS*	*UPMIS (italics: estimated)*	*Pegasus and UPMIS*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*Q2 report and perf. sheet (italics: esimates)*	*calculated from collections and O&M costs*
							No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
	Total / Average			**443,776**			**8,052**	**100%**	**248**	***9,034***	**35%**	***3,473***	**1,567**	**55%**	***96%***	n/a	**209**	**2,159**	**108.4**	**81%**	***64.1***	**129%**
1	Adilang		Agago	5,792	Solar	2,006	48	100%	12	60	52%	31	22	30%	*100%*		2	2,000	1.4	82%	0.6	179%
2	Adwari		Otuke	10,000	Solar	2,008	107	100%	-	245	18%	43	20	53%	*100%*		4	1,500	1.1	99%	0.7	158%
3	Agago TC		Agago	6,444	Grid/solar		180	100%	5	100	90%	*90*	23	*74%*	*96%*		4	2,500	2.0	64%	0.7	167%
4	Agweng		Lira	7,800	Grid	2,015	97	100%	2	245	*20%*	48	23	52%	*93%*		5	2,500	2.0	63%	1.2	97%
5	Alangi		Zombo	6,560	Solar	2,010	80	100%	9	25	109%	27	21	24%	*100%*		3	2,000	1.2	77%	0.6	147%
6	Alebtong		Alebtong	6,300	Solar	2,014	65	100%	-	50	85%	43	25	43%	*99%*		3	1,900	1.5	82%	0.7	180%
7	Alere	x	Adjumani	*6,700*			12	100%	12	*54*		43	18	59%	*100%*		4	750	0.3	66%		
8	Alero		Nwoya	9,958	Solar	2,002	11	100%	2	*3*		*2*	1	*43%*	*100%*		2	2,000	0.1	57%	0.1	108%
9	Amolatar		Amolatar	9,936	Diesel	2,002	297	100%	6	564	17%	93	52	45%	*86%*		9	2,500	4.5	90%	4.0	98%
10	Anyomolyec		Oyam	2,132	Solar	2,002	7	100%	2	50	5%	*3*	2	*37%*	*100%*		2	2,000	0.1	99%	0.1	132%
11	Atapara		Oyam				32			*30*		*24*	11				*2*	2,000	0.7	51%		
12	Ayilo II	x	Adjumani	*15,273*			110	100%	-	*54*	*100%*	*54*	31	*43%*	*95%*		3	750	0.7	61%	0.7	56%
13	Ciforo		Adjumani	6,468	Solar		92	100%	1	50	44%	*22*	16	*28%*	*100%*		2	2,000	1.1	76%	0.7	122%
14	Dzaipi		Adjumani	2,900	Grid/solar	2,003	25	100%	2	*16*	*100%*	*16*	6	*65%*	*95%*		3	1,700	0.3	42%		
15	Erussi		Nebbi	1,600	Solar	2,008	4	100%	4	50	16%	*8*	5	*40%*	*99%*		1	2,000	0.3	42%	0.1	92%
16	Iceme		Oyam	5,748	Solar	2,005	64	100%	2	*27*		*21*	16	*23%*	*99%*		2	2,000	1.1	91%	0.5	187%
17	Kamdini		Oyam	8,977	Grid	2,010	197	100%	7	*73*	*100%*	73	55	25%	*96%*		4	2,692	4.8	88%	2.6	155%
18	Kitgum Matidi		Kitgum	5,312	Solar	2,007	23	100%	12	32	44%	14	11	22%	*98%*		1	2,000	0.9	54%	0.3	227%
19	Kuru		Yumbe	5,536	Solar	2,010	40	100%	7	17	63%	11	6	46%	*99%*		3	2,500	0.5	90%	0.4	130%
20	Lagoro		Kitgum	*3,292*	Solar	2,006	50	100%	4	28	53%	*15*	9	37%	*100%*		4	2,000	0.6	83%	*0.3*	199%
21	Laropi		Moyo	9,212	Solar	2,004	171	100%	1	50	55%	*28*	25	11%	*100%*		2	1,500	1.3	56%	0.7	108%
22	Lefori		Moyo	9,492	Solar	2,012	55	100%	11	150	11%	*17*	12	30%	*100%*		2	1,700	0.7	70%	0.4	118%
23	Lokung		Lamwo	7,000	Solar		18	100%	5	*18*		*15*	11	27%	*100%*		2	2,000	0.6	57%	0.6	60%
24	Loro		Oyam	12,905	Grid	2,016	701	100%	6	*157*	*100%*	157	77	51%	*97%*		9	2,600	7.2	87%	4.6	131%
25	Ludonga		Yumbe	5,700	Solar	2,009	78	100%	8	58	51%	*29*	19	*35%*	*100%*		2	2,000	1.3	63%	*0.4*	183%
26	Madi Opei		Lamwo	9,932	Solar	2,003	43	100%	15	*29*		*23*	19	*18%*	*100%*		2	2,000	0.7	60%	0.2	174%
27	Maracha		Maracha	9,514	Solar	2,003	64	100%	1	216	8%	*18*	8		*100%*		3	2,500	0.7	44%	0.2	156%
28	Midigo		Yumbe	7,484	Solar	2,015	160	100%	-	120	21%	*25*	14	*43%*	*87%*		6	2,500	1.3	55%	0.7	103%
29	Minakulu		Oyam	10,712	Grid	2,010	207	100%	2	*78*		62	28	55%	*97%*		4	2,500	2.4	73%	1.1	151%
30	Mucwini		Kitgum	5,760	Solar	2,002	93	100%	4	240	5%	*12*	8	*28%*	*98%*		4	2,500	0.8	78%	0.5	122%

ANNEX 5 – NORTHERN UMBRELLA *(CONTINUED)*

	Scheme name	Ref. settle ment	District	Pop. served	Energy source	Year of constr.	Active connec-tions	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced	Water billed (con-sumed)	NRW	Continuity of supply	% of micro-biol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
				UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima-tions)*	*calculated (italics: estim. involved)*	*UPMIS (italics: estim. from Pegasus)*	*Pegasus (italics: corr. from UPMIS)*	*calc. (italics: estim. involved)*	*UPMIS (italics: incomplete data)*	*Data not available in UPMIS*	*UPMIS (italics: esti-mated)*	*Pegasus and UPMIS*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*Q2 report and perf. sheet (italics: esimates)*	*calculated from collec-tions and O&M costs*
							No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
31	Namukora		Kitgum	3,929	Solar	2,007	212	100%	6	*35*		28	27	4%	*95%*		4	2,000	1.9	100%	1.2	156%
32	Nyarwodho		Pakwach	57,112	Gravity	2,017	1,728	100%	25	4,000	32%	1,277	282	***78%***	*93%*		25	2,200	20.9	86%	13.4	132%
33	Nyumanzi	x	Adjumani	6,792			73	100%	3	52	97%	*50*	44	*12%*	*98%*		3	750	1.1	88%	0.5	183%
34	Ofua 3	x	Terego				27			*145*		*116*	*52*				*2*	750	1.2			
35	Okwang		Otuke	2,980	Solar	2,006	38	100%	-	50	18%	*9*	7	*25%*	*100%*		2	1,500	0.4	89%	0.2	150%
36	Olujobo-Tika	x	Madi Okollo				103			*82*		*66*	*30*				*3*	750	0.8			
37	Omiya-Anyima		Kitgum	1,472	Solar	2,016	20	100%		21	40%	*8*	5	46%	*100%*		1	2,000	0.3	77%	0.2	99%
38	Omugo 6	x	Terego				43			*46*		*37*	*17*				*2*	750	0.4			
39	Opit		Omoro	6,296	Grid/solar	2,015	186	100%	2	*62*	*100%*	62	28	55%	*100%*		5	2,500	2.3	81%	1.2	158%
40	Orom		Kitgum	1,912	Solar		11	100%	2	21	33%	*7*	5	*36%*			2	2,000	0.3	104%	0.2	142%
41	Otuke		Otuke	12,564	Solar		129	100%	4	*73*	*100%*	73	36	50%	*100%*		4	1,700	2.1	96%	*1.1*	183%
42	Otwal		Oyam	1,936	Solar	2,005	28	100%	4	30	21%	*6*	4	*33%*	*100%*		2	2,000	0.3	85%	0.2	117%
43	Ovujo		Maracha	22,056	Grid	2,015	203	100%	2	*58*	*100%*	58	35	40%	*91%*		4	2,500	3.0	83%	2.6	91%
44	Oyam		Oyam	15,568	Grid		259	100%	10	240	28%	68	49	29%	*93%*		4	3,000	4.8	79%	3.5	108%
45	Pabbo		Amuru	21,104	Solar	2,006	625	100%	5	285	36%	*103*	72	*30%*	*99%*		11	3,000	7.5	79%	5.0	120%
46	Padibe		Lamwo	2,032	Solar	2,007	10	100%	5	*13*	*100%*	*13*	10	*19%*	*100%*		1	2,000	0.6	67%	*0.2*	183%
47	Paimol		Agago	4,848			113	100%	4	*400*	14%	*57*	12	*79%*	*100%*		3	2,500	1.1	58%	0.4	143%
48	Pakele		Adjumani	10,524	Solar	2,004	187	100%	7	133	29%	*39*	29	*24%*	*99%*		5	2,500	2.5	80%	1.4	144%
49	Palabek Kal		Lamwo	2,672	Solar	2,007	54	100%	2	20	61%	*12*	11	*14%*	*99%*		2	2,000	0.7	104%	0.6	112%
50	Palabek Ogili		Lamwo	3,456	Solar	2,002	95	100%	1	*23*	*100%*	*23*	12	*46%*	*99%*		2	2,000	0.9	71%	0.3	181%
51	Palenga		Omoro	3,232	Solar	2,002	9	100%	10	20	29%	*6*	3	*43%*	*100%*		2	2,000	0.2	83%	0.2	109%
52	Paloga		Lamwo	3,536	Solar	2,002	50	100%	1	*24*		*19*	11	*44%*	*93%*		3	2,000	0.8	51%	0.4	106%
53	Purongo		Nwoya	19,080	Solar	2,015	220	100%	2	*51*	*100%*	51	34	33%	*99%*		4	2,000	2.3	100%	1.7	135%
54	Singila-Panyimur		Pakwach	22,040	Solar	2,012	333	100%	7	187	77%	143	*115*	19%	*100%*		9	1,700	6.6	78%	4.2	119%
55	Wadelai		Pakwach	3,668	Solar	2,013	156	100%	4	*69*	*100%*	69	43	38%	*99%*		3	2,200	3.0	96%	*1.5*	184%
56	Wati		Terego	528			9	100%		*6*		*5*	4	*13%*	*100%*		*2*	2,000	0.2	32%		
	Schemes still in takeover process as of December 2020																					
	Bidibidi Zone 5	x	Yumbe				46															
	Corner Kilak		Gulu	4,800	Solar	2,003	27															
	Koch Goma		Nwoya	3,568	Solar	2,005	29	100%	3								2	2,000				
	Schemes gazetted for management by the UA but currently non-functional (to be rehabilated before takeover)																					
	Agoro		Lamwo																			
	Olilim		Otuke	2,384	Solar	2,004											2					

ANNEX 6 – SOUTH-WESTERN UMBRELLA

	Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-tions	% metered conn.	Public water points	Installed Capacity	System capacity utilization	Water produced (supplied)	Water billed (con-sumed)	NRW	Continuity of supply	% of microbiol. tests complying	Staff number	Tariff (excl. VAT)	Monthly billing revenue	Collection efficiency	Monthly operation costs	Operating cost coverage (local costs)
			UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima-tions)*	*calculated (italics: estim. involved)*	UPMIS	*Pegasus (italics: corr. from UPMIS)*	*calc. from water supplied*	*UPMIS (italics: incomplete data)*	*UPMIS WQ report (not complete)*	*UPMIS*	*Pegasus and UPMIS*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*UPMIS*	*calculated from collec-tions and O&M costs*
						No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
	Total / Average		**341,764**			**6,059**	**100%**	**435**	***3,832***	**37%**	***1,435***	**1,055**	**27%**	***91%***	**87%**	**150**	**1,975**	**66.9**	**79%**	**48.3**	**115%**
1	Banyara	Kanungu	23,725	Gravity	2,002	262	100%	77	233	77%	181	*126*	30%	*98%*		7	820	3.4	86%	2.1	136%
2	Bikurungu	Rukungiri	12,300	Solar/diesel	2,010	142	100%	6	130	23%	29	23	24%	*94%*	100%	6	3,390	2.4	78%	2.5	74%
3	Bugangari-Katabushera	Rukungiri	9,760	Gravity	2,010	137	100%	14	43	75%	32	23	28%	*97%*	100%	5	2,119	1.6	68%	0.9	117%
4	Buhoma	Kanungu	22,240	Gravity	1,999	198	90%	11	*105*	*100%*	105	78	26%	*92%*		4	820	1.9	75%	1.2	121%
5	Buhunga	Rukungiri	14,390	Gravity	2,002	254	100%	7	*31*	*100%*	31	23	28%	*94%*	100%	5	2,119	1.7	80%	1.3	104%
6	Buraro	Ntungamo	28,760	Gravity	2,005	200	100%	27	130	40%	52	39	24%	*95%*	100%	5	2,119	2.5	81%	1.6	124%
7	Igorora	Ibanda	26,384	Gravity		417	100%	23	*140*	*100%*	140	109	22%	*98%*	100%	9	2,119	7.2	87%	4.4	143%
8	Isingiro TC	Isingiro	34,421	Gravity	2,010	878	100%	9	850	21%	177	*134*	24%	*84%*	50%	10	2,119	10.2	86%	6.2	142%
9	Kabingo	Ibanda	977	Pumping		34	100%	9	*6*		5	3	25%	*25%*		2	3,390	0.3	56%	0.3	73%
10	Kabirizi	Rubanda	9,876	Gravity	2,000	183	100%	9	113	33%	37	27	27%	87%	89%	4	2,119	1.9	86%	1.4	114%
11	Kabuga	Rukungiri	8,370	Gravity		220	100%	*1*	130	37%	48	35	27%	*90%*	100%	6	2,119	2.5	71%	1.6	112%
12	Kahihi	Mitooma	2,321	Gravity		113	100%	10	48	37%	18	13	26%	*95%*	50%	3	2,119	0.9	95%	0.8	109%
13	Kanyarugiri	Ibanda	4,671	Grid	2,013	99	100%	32	240	10%	25	18	28%	*89%*	67%	3	3,390	1.7	79%	1.5	90%
14	Karenga-Myambi	Kisoro	2,392	Gravity		8	100%	3	*4*		3	2	27%	*90%*		2	2,119	0.1	63%	0.3	27%
15	Karukara-Hamurwa	Rubanda	18,770	Gravity	2,001	131	100%	7	181	31%	57	*41*	28%	*93%*	100%	5	2,119	3.1	71%	1.8	118%
16	Kasumanga	Isingiro	4,382	Gravity	2,010	73	100%	18	68	34%	23	17	27%	*94%*	100%	2	2,119	0.9	98%	0.7	127%
17	Katagata	Mitooma	1,231	Gravity	2,013	96	100%	18	98	24%	24	18	26%	*97%*	50%	3	2,119	1.1	101%	0.8	134%
18	Katuna	Kabale	11,300	Gravity	2,010	74	100%	2	54	43%	23	17	27%	*94%*	86%	3	2,119	1.2	83%	0.8	121%
19	Kisiizi	Rukungiri	5,763	Gravity	2,002	79	100%	5	136	15%	21	15	29%	*89%*	100%	2	2,119	1.0	82%	0.7	120%
20	Kitojo	Rukiga	2,870	Gravity	2,004	215	100%	10	51	49%	25	19	25%	*96%*	100%	4	2,119	1.2	61%	0.8	88%
21	Kiyenje-Bwanga	Rukungiri	12,780	Gravity	2,011	285	100%	5	123	49%	60	42	30%	*98%*	100%	8	2,119	2.9	93%	2.2	123%
22	Kyezimbire	Isingiro	9,382	Gravity	2,012	54	100%	13	112	10%	11	8	26%	*95%*	100%	2	2,119	0.4	60%	0.4	58%
23	Matsyoro I	Sheema	17,358	Gravity	1,991	266	100%	28	173	16%	*28*	*21*	*26%*	*90%*		14	2,119	1.3	40%	3.8	14%
24	Mugyera	Rukungiri	12,351	Gravity		350	100%	11	102	56%	57	*41*	27%	*92%*	100%	8	2,119	2.7	61%	1.6	105%
25	Noozi	Rukiga	680	Gravity	2,000	105	100%	1	95	15%	14	10	27%	*96%*	57%	3	2,119	0.8	64%	0.8	61%
26	Nyabushenyi	Rukungiri	9,370	Gravity		141	100%	5	118	19%	22	16	27%	86%	100%	3	2,119	1.2	88%	1.1	98%
27	Rubuguri	Kisoro	12,420	Gravity	2,003	231	100%	26	173	46%	80	*60*	25%	*90%*		3	2,119	4.4	67%	2.5	119%
28	Rugaaga	Isingiro	6,295	Pumping	2,010	505	100%	*22*	*27*	*100%*	27	20	27%	*80%*	100%	7	3,390	2.2	59%	1.3	100%
29	Rwene	Kabale	9,472	Gravity	2,011	242	100%	15	39	109%	42	30	30%	*97%*	93%	7	2,119	2.1	80%	1.5	113%
30	Rwenshama	Rukungiri	3,478	Gravity	2,002	28	100%	5	36	68%	25	*18*	29%	*93%*	100%	2	3,390	1.4	53%	0.6	129%
31	Ryakarimira	Kabale	3,275	Pumping	2,002	39	100%	6	43	31%	13	10	26%	*95%*	75%	3	3,390	1.0	84%	1.0	84%

ANNEX 6 – SOUTH-WESTERN UMBRELLA *(CONTINUED)*

Schemes still in takeover process as of December 2020

Scheme name	District	Pop. served	Energy source	Year of constr.	Active connec-	% metered	Public water	Installed Capacity	System capacity	Water produced	Water billed (con-	NRW	Continuity of supply	% of microbiol.	Staff number	Tariff (excl.	Monthly billing	Collection efficiency	Monthly operation	Operating cost coverage
		UPMIS & Q2 report	*UPMIS & Q2 report*	*UPMIS*	*UPMIS & Q2 report*	*UPMIS & Q2 report*	*UPMIS*	*UPMIS (italics: estima- tions)*	*calculated (italics: estim. involved)*	UPMIS	*Pegasus (italics: corr. from UPMIS)*	*calc. from water supplied*	*UPMIS (italics: incomplete data)*	*UPMIS WQ report (not complete)*	*UPMIS*	*Pegasus and UPMIS*	*Pegasus, excl. VAT*	*calc. from Pegasus bills and payments*	*UPMIS*	*calculated from collec- tions and O&M costs*
					No.	%	No.	m³/day	%	m³/day	m³/day	%	%	%	No.	UGX/m³	UGX million	%	UGX million	%
Bukiro	Mbarara	4,600	Gravity		190	0%	84	173							2					
Kamuhembe	Sheema	8,924	Gravity	2,005	53	100%	1	46							3					
Kanyinamigyera	Sheema	3,865		2,012	33	0%	25	43							2					
Karembe	Buhweju	4,420	Gravity	2,015	50	100%	10													
Kayonza	Buhweju	6,870	Gravity	2,015																
Mwihe A	Kisoro	1,206		2,005	33	0%	5	43							2					
Mwihe B	Kisoro	1,374		2,005	108	0%	12	86							2					
Nyakagabagaba	Rukiga		Gravity	2,002																
Rutehe 1	Buhweju	1,320	Gravity	1,999																