Republic of Uganda

MINISTRY OF WATER AND ENVIRONMENT

DIRECTORATE OF WATER DEVELOPMENT

RURAL WATER AND SANITATION DEPARTMENT

IN COLABORATION WITH

UNICEF-UGANDA

REPORT FOR KAMULI DISTRICT WATER INFRASTRUCTURE ASSET ANALYSIS AS AT DECEMBER 2019

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1 INTRODUCTION

1.1 Background

The Local government act (1997) specifies functions for Central Government as inspection and monitoring of local governments' activities and ensuring adherence to the rule of law. The Ministry of Water and Environment (MWE), through the Directorate of Water Development (DWD) is the lead agency responsible for regulation of water services and for providing overall technical oversight for planning, implementation and supervision of the delivery of urban and rural water and sanitation services across the country, including water for production. It is also charged with providing support services to local governments, private operators and other service providers.

1.2 Introduction to Asset Analysis Training and data collection in Kamuli

The Ministry of Water and Environment with support funding from UNICEF conducted Asset Analysis training and data collection in Kamuli District Local Government. Kamuli DLG is comprised of 14 sub counties, 82 parishes and 699 villages and 2 town councils. The estimated number of point water sources was about 1145 with technology mix comprising of majorly deep boreholes, rain water harvesting tanks and piped water systems. In Kamuli District data was collected and analyzed for a total of 1290 No.point water sources and 7 No. piped systems.

The activity commenced with 2 days of training the enumerators and this was followed by intensive data collection for a period of 2 weeks. The training was conducted by the TSU 10 officers together with the IT Officer of the Ministry of Water & Environment. The training was conducted in October 24th,-25th, 2019. A total of 20No. Participants were trained as enumerators. Participants included water office staff; Selected Social mobilizers (Health Assistants & Community Development Officers) from Lower Local Government.

This report presents detailed findings of water infrastructure asset analysis for Kamuli district.

1.3 Objective of the District Water Point System Asset Analysis

The general objective of the Asset Analysis is to identify, catalog, and classify all water systems within a district based on current needs, level of water service provision, and general timeline for eventual repair and/or replacement of significant components.

In order to prioritize which water systems will require intervention, the Asset Analysis tool assesses three different risk areas for a particular water system.

1. *Age of Water System Components:* The Asset Analysis takes into account the current age and projected lifespan, or "useful life," of key water system components (e.g. intake structure, storage tank, etc.).

2. *Overall Functionality and Level of Service Provided by Water System*: The Asset Analysis assesses the overall level of service the water system provides, including an evaluation of water quantity, quality, consistency, and comprehensiveness of water services.

3. *Physical State of Water System Components*: Finally, the Asset Analysis assessment includes an evaluation of each key water system component's physical state to assess where certain components would be at risk of failure or limited functionality.

1.4 Why Water Systems Asset Analysis?

Overall, using the above three risk areas, the Asset Analysis helps to flag, prioritize, and classify different water systems within a district based on risk and need for repair, and helps provide a foundation for a long-term plan to maintain, repair, augment, or replace a water system when necessary. The information will assist District Local Governments who receive conditional grants to plan for Operation and Maintenance (O&M) of the systems. They will be able to identify risk areas with respect to piped water systems in their district and plan for rectification. The Ministry of Water and Environment, Rural Water and Sanitation Regional Centers (RWSRCs), Umbrella Organizations, and Water and Sanitation Development Facilities can then help in providing technical support to the District Local Government. The generated database could also be used by the Monitoring Unit of the Rural Water Department to plan for future surveys and follow-up.

2 PROCESS OF DISTRICT WATER SYSTEMS ASSET ANALYSIS

2.1 Training on data collection

The Asset Analysis excises in Kamuli district commenced with training of enumerators in October 2019. The objectives of the training were;

➢ Equip enumerators with data collection skills and knowledge of the survey tool (Ackvoflow)
➢ Orient the enumerators to asset analysis questionnaire for point and piped water systems
➢ Build the capacity of the enumerators on use a smart phone and   flow application
➢ Develop Action planning for data collection

2.1.1 Training outcome

➢ Capacity of the enumerators built to collect data on water infrastructure assets
➢ Data analysis to be done to identify, catalogue, and assess all the water systems in the district based on their current age, need, level of service delivery.
➢ Information to guide sector planning and resource mobilization

2.2 Data collection

The training was followed by the process of data collection by 12 no selected enumerates with close supervision by MWE through the Senior Engineer and IT Officers with back up support from IOM Coordinator.

2.3 Data Cleaning, Asset Analysis and CapManex Costs Determination

When data is collected, it usually contains errors, which can be grammatical, numerical, technical, etc. which need to be corrected before the data is analyzed. Essential data may also be missing requiring filling after consultation with data collectors, this process is called data cleaning. The cleaned data is then subjected to analysis using the CapManEx Analysis tool and the Asset analysis tool to produce the outcome presented in here.

3   FINDINGS ON THE ASSET ANALYSIS FOR KAMULI DISTRICT

3.1   Analysis on Level of Priority to Repair or Replace Point and Piped Water Systems

The Ministry of Water And Environment carried out Asset Analysis in Kamuli District to determine the level of priority for repairs, replacement and CapManex of all water systems/facilities in the district. The Findings below show the levels of priority for repair and replacement for point sources determined in Kamuli district, which is helpful for district-level decision making. In Kamuli District, data was collected on a total of 1290 point water sources and 7 Piped water systems and these were subjected to the Asset analysis and CapManEx analysis tools.

Table 1: Number of point water sources and Piped Systems analyzed for priority to replace/repair

Level Of Priority To Replace/Repair	Point sources	Piped Systems
Medium Priority	668	3
Low Priority	436	4
New Construction Needed	11	
High Priority	**175**	
Grand Total	**1290**	**7**

In Figure 1 results show that 1% of the point sources in Kamuli need to be reconstructed and 13,6% need urgent Repair/rehabilitation. The piped system are relatively in good condition but the district should plan to improve the 3 systems which contribute to 43% with medium priority. 'Without addressing these needs, the district runs the risk of a complete breakdown of these systems.
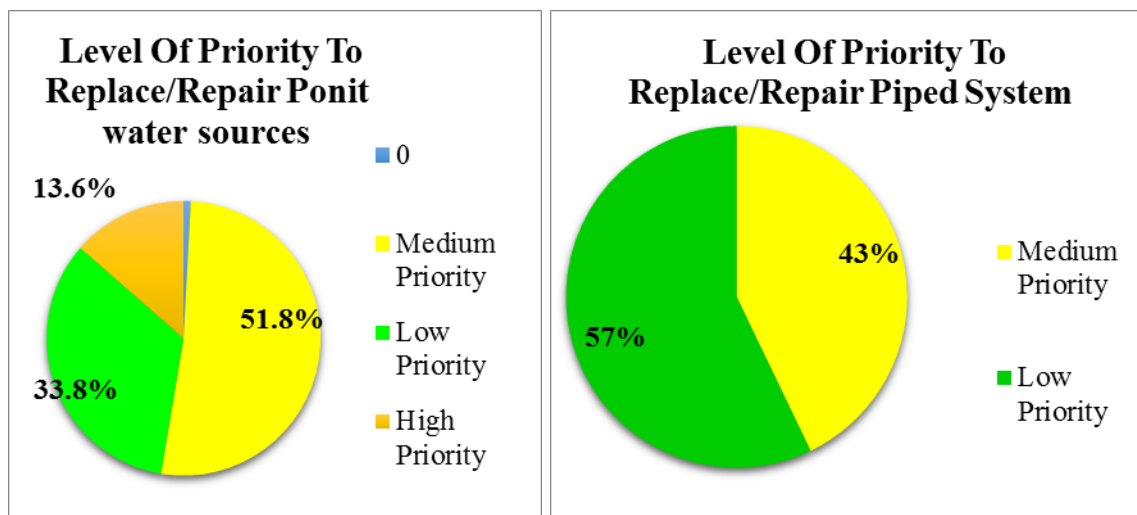

Figure 1: Kamuli District Point and Piped Water Systems Level of Priority to replace

3.2 Piped and Point Water Systems Analysis based on Age

In Figure 2 results also show that 30.7% of the point sources in Kamuli district have outlived their useful life and are prone to break down and 29% of the piped systems are at high risk due to age. Table 2 summarizes the details of number of facilities at a risk based on life time of the systems.
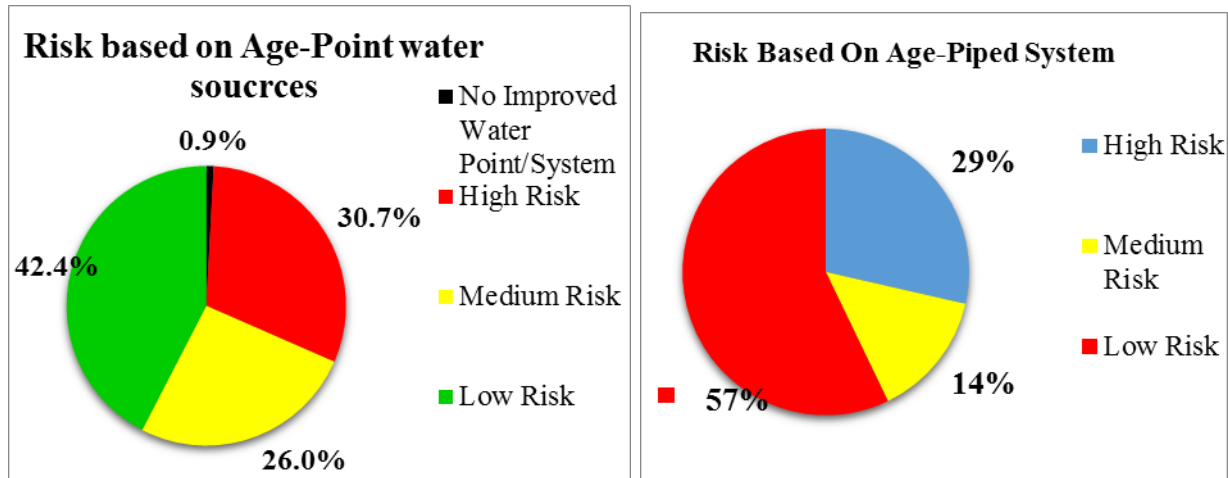

Figure 2: Kamuli Point Water Sources and Piped Systems Risk Based on Age

Table 2: Risk based on lifetime

Level Of Risk At End Of System Lifetime	Point sources	Piped systems
No Improved Water Point/System	11	
High Risk	396	2
Medium Risk	336	1
Low Risk	547	4
Grand Total	**1290**	**7**

3.3 Piped and Point Water Systems Analysis based on Current Condition

In figure 3, the findings indicate that 9.7% of the existing point water sources in Kamuli are generally in a very poor condition. The piped systems were fairly in good condition at the time data collection was done, hence all showed a low risk based on condition
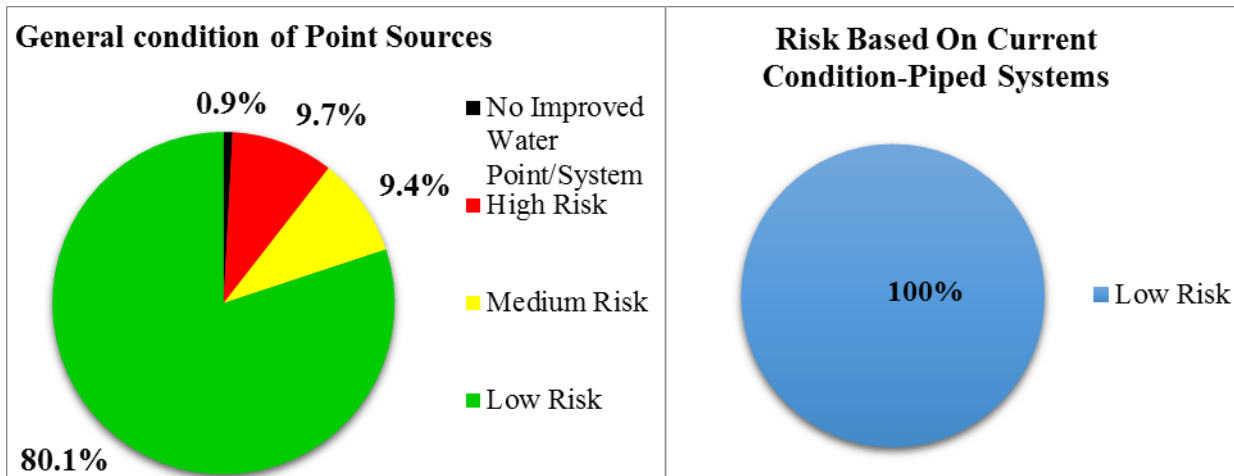
Figure 3: Kamuli Point Water Sources and Piped Systems Risk Based on current condition of facilities

3.4 Piped and Point Water Systems Analysis based on Level of Service

In figure 4 we see the general level of service the facilities are providing in their current state. We observe that 45.7% of the point sources and 29% of the piped water systems are providing a basic level of service while 3.3% of point water sources provide inadequate level of service. The ultimate desire is for the high level of service that neither the point water sources nor the piped systems in Kamuli provide.
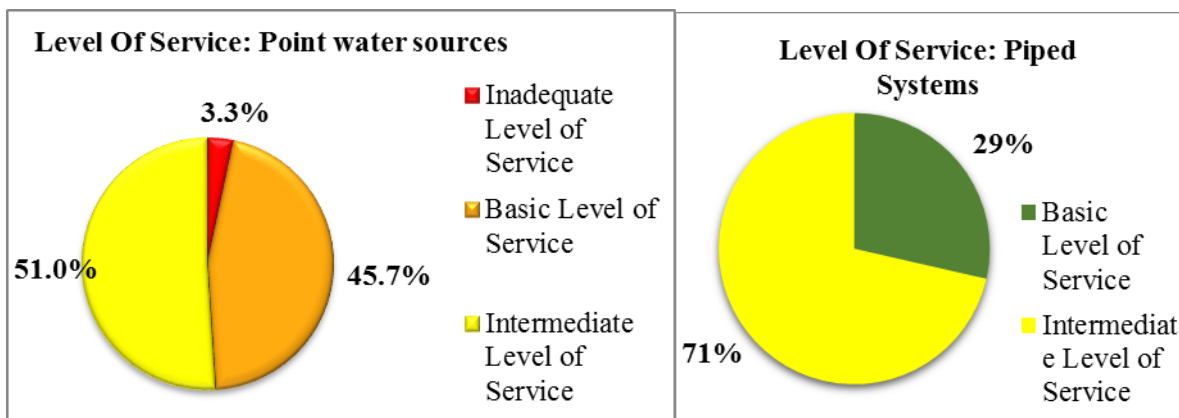

Figure 4: Kamuli Point Water Sources and Piped Systems Level of Service

3.5 CapManEx Costs for Point Water Sources in Kamuli

The process of CapManEx cost determination is supported by a taskforce consisting of a Ministry of Water and Environment engineer, economist, IT representative, monitoring and evaluation (M&E) staff, a UNICEF representative, and a Water for People engineer and M&E officer.

Table 3 highlights the key components of a point water system (borehole or spring), their useful/design life, cost for replacement of each component, and estimated annual cost for repair and maintenance.

Table 3: Point Based Water System Component Costing Template Based on Estimate

Component	Design life time (years)	Cost for replacement of each component (District costs)	Annual Cost for repair (District costs)
Well	20	UGX 17,000,000	UGX 0
Pump (Cylinder, head assembly, pedestal)	10	UGX 2,000,000	UGX 300,000
Apron/Seal	20	UGX 500,000	UGX 100,000
Desilting of a well	20	UGX 350,000	UGX 100,000
Spring Protection (this includes all masonry works)	20	UGX 500,000	UGX 60,000
Spouts	10	UGX 50,000	UGX 10,000
GI Pipe and Rod (All to be replaced with SS)	5	UGX 360,000	UGX 280,000
PVC Pipes and Rod	5	UGX 235,000	UGX 235,000
SS Pipes and Rod	10	UGX 360,000	UGX 180,000

Table 4 shows the determined costs capital maintenance of point water sources in Kamuli district over the next ten years and Figure 6 summarizes them graphically. The Costs are based on the assumption that all facilities that do not function and those in poor state will be given priority in the first three years to come. i.e. in the years 2019-2021 and after that major maintenance expenditure will be for replacing components that have out lived their design life.

Table 4: Kamuli Capital Maintenance Costs for Point Water Sources over ten years period

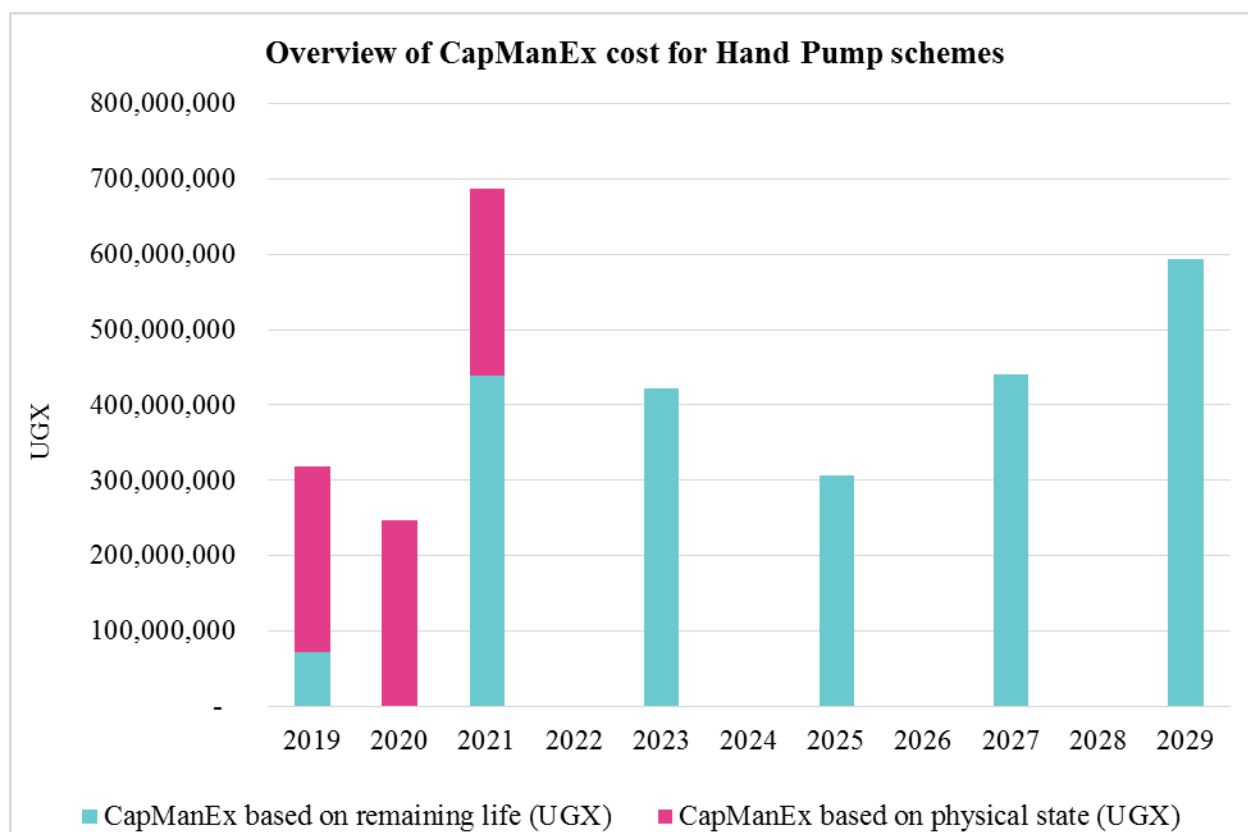| Overview of the CapManEx (RWF)	2019	2020	2021	2023	2025	2027	2029	Total
CapManEx based on remaining life (UGX)	71,500,000	-	439,500,000	422,500,000	306,500,000	440,500,000	593,500,000	
CapManEx based on physical state (UGX)	247,378,750	247,378,750	247,378,750	-	-	-	-	
Total	**318,878,750**	**247,378,750**	**686,878,750**	**422,500,000**	**306,500,000**	**440,500,000**	**593,500,000**	**3,016,136,250**

Figure 1: CapManEx for Point Water sources in Kamuli

3.5.1 CapManEx Costs for piped water systems in Kamuli

Data analysis for 7 piped water systems in Kamuli District Using the CapManEx tool shows that as at 2019 status of these facilities, the district requires UGX 654,985,083 to replace the system components that are in a poor physical state/condition and those that will have outlive their design life over the next

ten years. Figure 7 gives the graphical representation of the Capital maintenance costs required each year from 2019 to 2029.

Table 5: Summary of Capital Maintenance costs for Piped water Systems in Kamuli

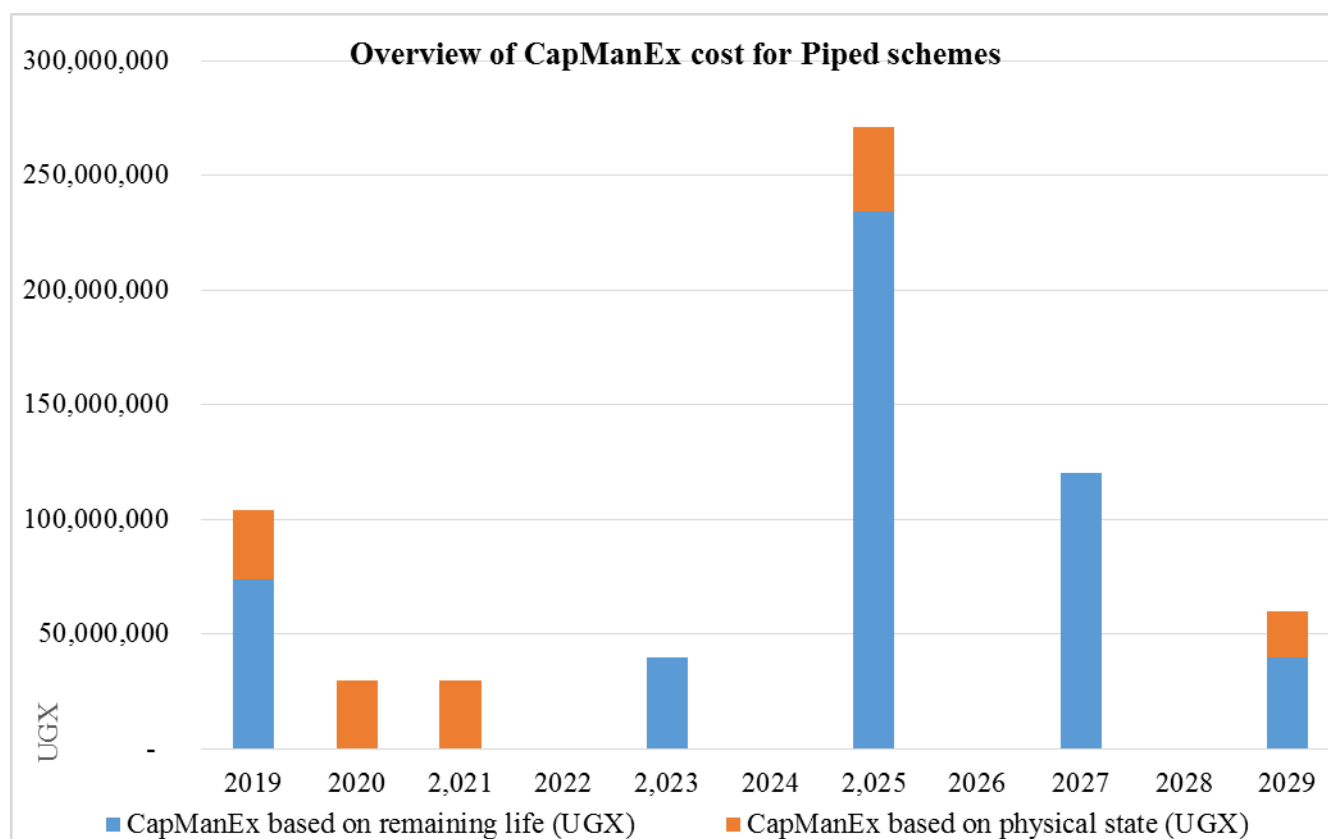| Overview of the CapManEx piped Systems	2019	2020	2,021	2,023	2,025	2027	2029
CapManEx based on remaining life (UGX)	74,000,000	-	-	40,000,000	234,000,000	120,000,000	40,000,000
CapManEx based on physical state (UGX)	29,995,028	29,995,028	29,995,028	-	37,000,000	-	20,000,000
Total	**103,995,028**	**29,995,028**	**29,995,028**	**40,000,000**	**271,000,000**	**120,000,000**	**60,000,000**

Figure 2: Kamuli District Capital Maintenance costs for piped water system components

4 Challenges:

- The biggest challenge in the Asset Analysis process is availability of reliable and complete data of water sources in the district. Because of the lack of complete data in most cases, fresh surveys had to be conducted to collect data on the types of water systems, age of system components, yield, functionality, and physical state, among others. Additionally, the cost of surveys is expensive, which makes Asset Analysis process expensive.
- Long distance from one water point to another. In addition to unfavorable weather conditions, data was collected during a rainy season and it was a big challenge to access the sources amidst poor, muddy and flooded roads

5 Recommendations:

- Development partners need to support the ministry of water and Environment to improve access to safe water in the country, by supporting the process of asset analysis to establish the current state of the facilities in the entire country for better planning and resource allocation
- The use of mobile phones with the Akvo Flow tool to collect data makes the process of data collection easier and digital data collection should be adopted across the sector
- The district water office should prioritize provision of water points to most water stressed villages and rehabilitation of the sources at high risk of breaking down due to poor state or old age.

6 Conclusion

Asset analysis was smoothly conducted in Kamuli district despite the challenges met and the results should guide planning and resource allocation for better service delivery.

Kamuli Local Government appreciated the exercise on asset analysis and commended the Ministry of Water and Environment and UNICEF for selecting Kamuli as beneficiary of the activity.
Ministry of water and Environment appreciates the Technical and political leadership of Kamuli for the cooperation that made the exercise run smoothly to conclusion.

Great appreciation is extended to UNICEF for funding and supporting the entire process of asset analysis in Kamuli district.