

# Fecal Waste Management (FWM) in Mbarara Municipality, Uganda



## Introduction

Mbarara Municipality is located in the western region of Uganda, approximately 260 km from the capital city, Kampala. It is the main municipal, administrative, and commercial center of Mbarara District and hosts the district headquarters. According to the 2014 population and housing census, Mbarara Municipality had a total population of 195,160 inhabitants (UBOS, 2016) who are disproportionately distributed within its six divisions. This population increases by 20% during the day due to people who work in, but live outside the Municipality.

The African Population and Research Center (APHRC) carried out primary research as well as desk reviews to establish policy and practice around fecal waste management in the Municipality. In addition, it used World Bank tools, the Shit Flow Diagram (SFD) and the City Service Delivery Assessment (CSDA) to determine and illustrate the FS pathways from containment systems through collection and transportation to treatment and reuse/end-disposal; and to assess the quality of the enabling environment, the level of service delivery and commitment to service sustainability.

Mbarara Municipal Council (MMC) has very few stakeholders working in fecal waste management. They include Mbarara Municipal Council, local branches of the national-level Ministry of Water and Environment (MWE), National Water and Sewerage Corporation (NWSC), National Environmental Management Authority (NEMA), Ministry of Health (MoH) and few stakeholders drawn from civil society. The Ministry of Finance, Planning and Economic Development (MoFPED) has influence on sanitation and FWM due to their function in budgeting and resource allocation for all sectors.

Sewer coverage is low, and majority of the population in MMC uses shared onsite sanitation facilities. Traditional pit latrines are most common at 96%, with septic tanks accounting for a fifth of containment facilities. The use of ventilated pit latrines and flush toilets exists in almost equal measure. Connection to sewers is limited although the health inspectorate department reports that the National Water & Sewerage Company (NWSC), through its Mbarara Branch, is expanding its sewerage network in *Biafra*, *Kiswahiri*, *Kashanyarazi*, *Kakyeka* and *Makenke*. Presently, the main sewer lines discharge into three wastewater treatment plants, which are, by definition, waste stabilization ponds. The combined total flow of the sewage treated at the three waste stabilization pond systems located in Mbarara is 540 m<sup>3</sup>/d, with 200 m<sup>3</sup>/d for *Katete*, 160 m<sup>3</sup>/d for *Kijungu* and 180 m<sup>3</sup>/d for *Kakoba* pond systems. This flow is equivalent to just about 5% of the total sewage flow expected to be generated in Mbarara Municipality.

Emptying costs are high and private sector involvement in emptying sanitation facilities is low. Sanitation facilities are mainly emptied mechanically using vacuum trucks or cesspool emptying vehicles, with only two service providers dealing with pit emptying using cesspool emptiers. The NWSC cesspool emptier, upon demand, occasionally empties the sludge from septic tanks. A private pit emptier charges a minimum of UGX 70,000<sup>1</sup> per event, depending on distance, with the owners of septic tanks located far paying higher charges. The private emptier then pays UGX 10,000 per truckload to discharge fecal sludge in the lagoons operated by the National Water and Sewerage Corporation (NWSC). During their work, pit emptiers use protective gear such as gloves, and are aware of their exposure to diseases like cholera or dysentery if they are not protected.

## City Service Delivery Assessment (CSDA)

CSDA refers to the analytical framework that measures the quality of the enabling environment, the level of service development and the level of commitment to service sustainability for water, sanitation and hygiene services (Peal *et al.*, 2014). It supports a systematic process for working with stakeholders to assess the enabling environment for City-wide Inclusive Sanitation (CWIS). It is accompanied by an action checklist to help stakeholders identify and prioritize immediate and follow-up actions to improve the enabling environment to facilitate the delivery and sustained operation of sanitation services (Blackett & Hawkins, 2019). The CSDA aims to be objective and transparent, with engagement of key stakeholders in the cost-effectiveness analysis, which can be updated over time as per the varying sanitation levels.

Relevant documents e.g. national policies, acts, and budgets were reviewed to assess past, current and future sanitation practices/trends in Mbarara Municipality, Uganda. Additionally, interviews were administered to key stakeholders directly involved in the city's sanitation in Mbarara municipality. The essential stakeholders for developing a city-wide inclusive sanitation services were identified and analyzed in an influence-interest matrix. Key stakeholders were involved in the study through visits to their premises and arranging one-on-one interviews and/or participation in workshops. Additionally, the Urban Sanitation Status Index (USSI) tool was used to visualize the sanitation status at neighborhood-level based (Ross, 2016) using the data from the household semi-structured interviews. Accordingly, six indicators were identified to form the components of Urban Sanitation Status Index for Mbarara (Table 1).

An initial CSDA was conducted with only a few indicators agreed upon by the stakeholders, which were not aggregated into building blocks nor disaggregated along the service chain. The CSDA tool was thus used with just the following three pillars:

<sup>1</sup> 1USD=3,683.5 UGX

**Table 1: Components and indicators in USSI**

Component	Indicator	Information source
Containment	Toilet facility accessibility	Household
	Structural integrity	Household
	Hygiene improvement	Household
Emptying	Access to emptying services	Household
Transport	Transport facility and affordability (emptiers)	Household/service providers
Treatment and Disposal	Level of treatment and final disposal	NWSC/ Wetlands officers

- I. **Enabling:** the policy, legal and institutional environment,
- II. **Delivering:** the resources and mechanisms available to improve sanitation, and
- III. **Sustaining:** the operating environment, funding and personnel needed to provide ongoing and sustainable sanitation services.

Each pillar is composed of three building blocks, of which one focuses on inclusion. Each building block, in turn, is composed of between one and four indicators, or specific questions, which were each assigned a score during the assessment process. The tool calculated the mean value for each step of the sanitation service chain in each building block, and presented it in traffic light form – green for satisfactory, yellow for improving, and red for poor. Separate assessments were made for sewerred and non-sewerred sanitation, while inclusion was assessed independently of sanitation type.

A review of an action checklist arising from the CSDA was then undertaken with the relevant stakeholders to identify and prioritize the interventions to eventually improve the institutional enabling environment for city-wide sanitation services. The red building block in the CSDA that links to the corresponding thematic areas are addressed by taking the appropriate action.

The initial CSDA (Figure 1) was performed with a few indicators covering institutional capacity, recurrent funding and outcomes for both non-sewer and sewerred sanitation as well as inclusiveness of both. The graphics from this initial CSDA are shown with traffic-light scoring of the various components of the enabling environment. The results of the next stage of the full CSDA for each of the sanitation technologies/systems for Mbarara Municipality using three pillars of enabling, delivering and sustaining are as presented in Figure 2. This stage was supported by stakeholder analysis, performed in an influence-interest matrix (Table 2). This is important to know, which stakeholder(s) to engage for the actions to be strongly consulted and involved throughout the planning, implementation as well as operation and maintenance of any planned interventions. Those in the cell of intersection of high-influence but low-interest and high-interest but low-influence ought to be involved as elucidated in Table 2.

**Table 2: Influence-Interest Matrix**

	LOW INFLUENCE	HIGH INFLUENCE
LOW INTEREST	Stakeholders are unlikely to be closely involved in the project and require not more than information sharing aimed at the ‘general public’ <b>INFORMATION</b>	Stakeholders may oppose the intervention. Therefore, they should be kept informed and their views acknowledged to avoid disruption or conflict <b>CONSULTATION - INFORMATION</b>
HIGH INTEREST	Stakeholders require special effort to ensure that their needs are met and their participation is meaningful. <b>CONSULTATION - EMPOWERMENT</b>	Stakeholders should be closely involved to ensure their support for the project. <b>CONSULTATION – COLLABORATION-EMPOWERMENT/DEGENERATION</b>

CSDA traffic light scores:

■ Green: well managed

■ Yellow: an emerging or partial improvement

■ Red: poorly managed or non-existent sanitation services

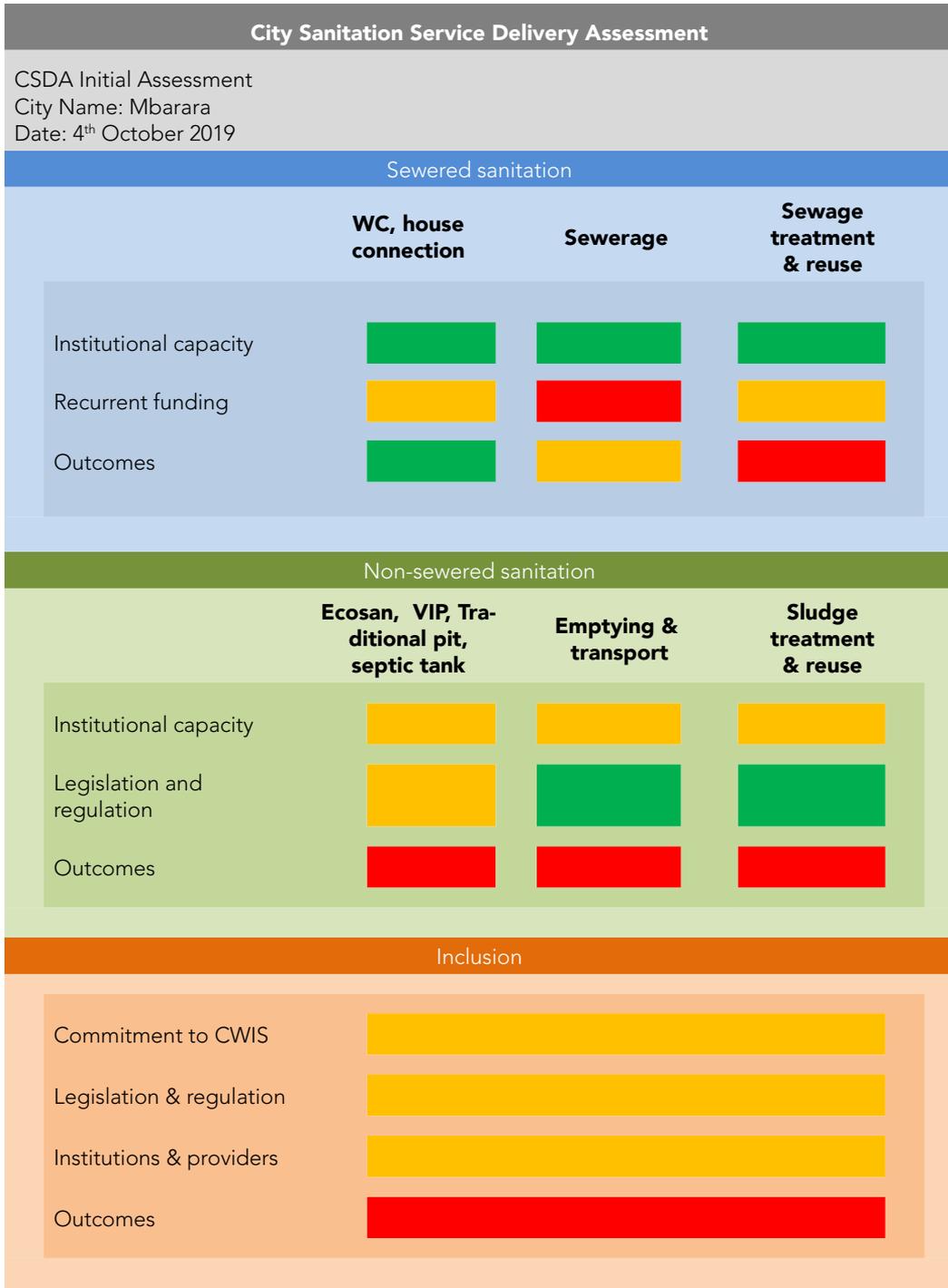
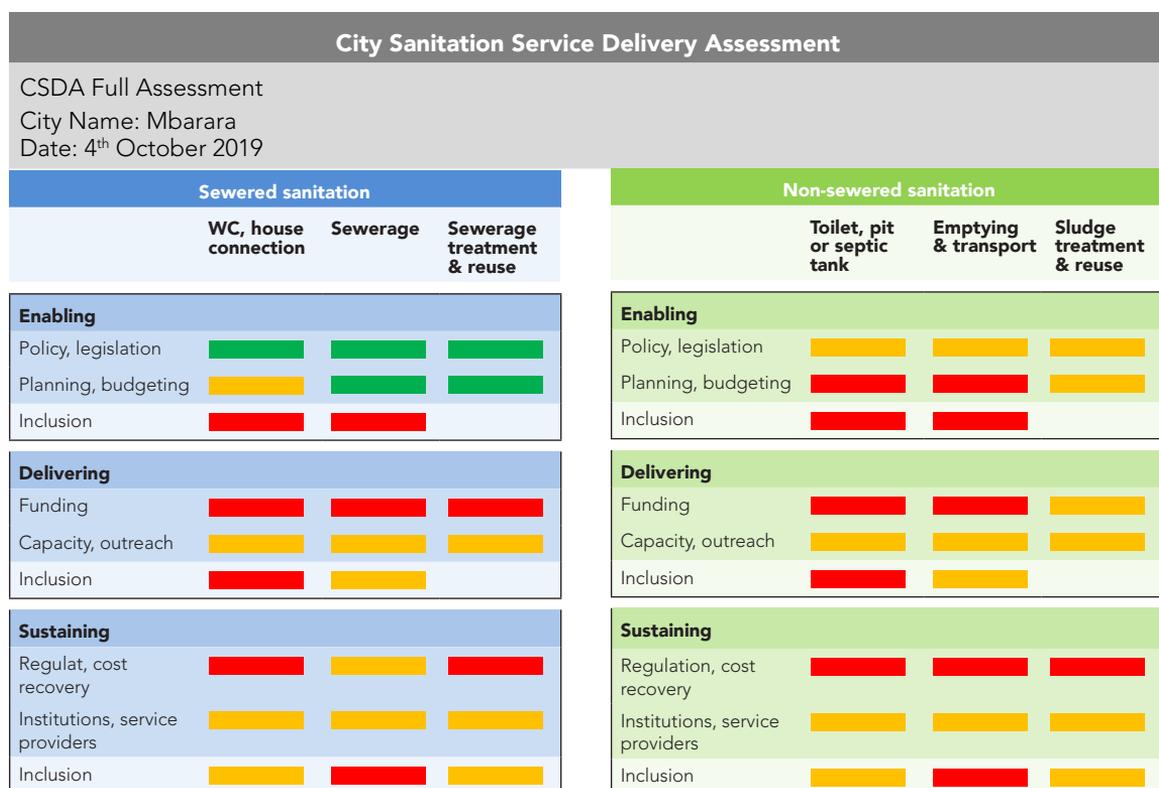


Figure 1: CSDA initial assessment results



**Figure 2: Full CSDA output for Mbarara**

According to **Figure 2**, under enabling for non-sewer sanitation, the indicator scores obtained show red on planning and budgeting for containment, emptying and transport, which is not the case for sewered sanitation. This depicts that service levels are set but currently no targets in city development plans, with limited budget lines at the implementation of non-sewered sanitation at the containment, emptying and transporting stages of the sanitation service chain. However, the treatment stage shows yellow because the treatment plant designed for only wastewater receives also fecal sludge; and this affects its efficiency in treatment. Indicator scores show yellow scoring for the legislation and policy indicators throughout the entire chain, suggesting available, approved and well acknowledged policies with established institutional role. Also, legislation and regulatory mechanism are in place although not widely disseminated. The red scoring under the delivering pillar is an indication that there is no existing investment plan at the containment, emptying and transporting levels of service chain and no coordination, which are exacerbated by the lack of a sanitation or FSM Master Plan for Mbarara. The funding allocations for non-sewered sanitation are not adequate with only the Uganda Sanitation Fund (USF) programme as a source of funding identified, yet, it funds activities only in rural areas.

The sustaining pillar is red due to no cost-recovery and lack of a specific local legislation targeting on-site sanitation and fecal waste management, for instance a by-law or ordinance. The institutions are yellow because they are in place but not strong enough due to low level of manpower and lack of resources to oversee implementation of activities while the service providers are too few to result into any meaningful competition that could lower charges, for instance for emptying. There exists no green indicator on the on-site sanitation at any part of the service chain, yet, it serves the majority in Mbarara Municipality. This highlights the need to support this regime of service delivery.

## CSDA results summary

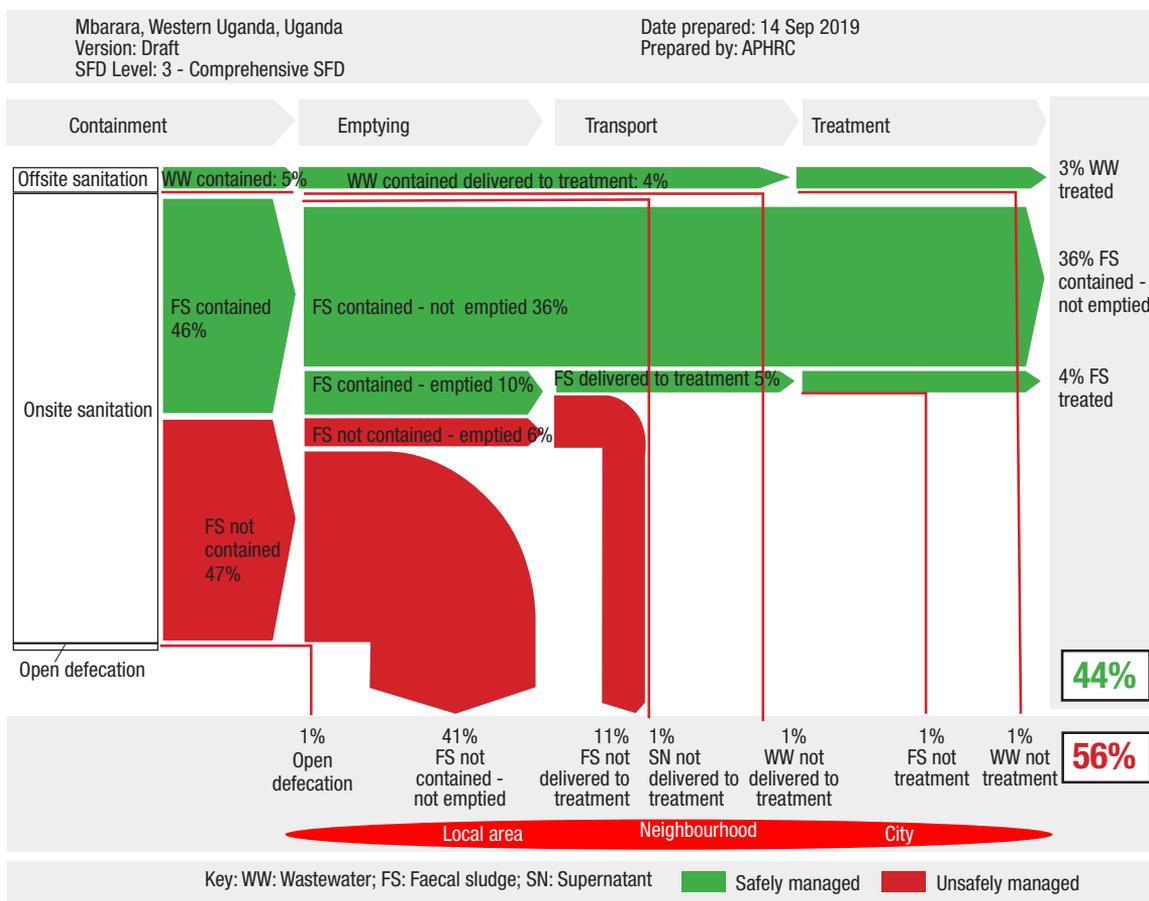
1. Indicator scores on planning and budgeting suggest that service levels are set but no targets in city development plans currently, with limited/no budgets at the implementation of non-sewered sanitation at containment, emptying/transporting stages of sanitation service chain.

- Indicator scores for the legislation and policy, suggest available, approved and well acknowledged policies with established institutional roles. Also legislation and regulatory mechanism in are place although not widely disseminated.
- There is no existing public investment plan at the containment, emptying and transporting levels of service chain and no coordination, which are exacerbated by the lack of a sanitation or FSM Master Plan for Mbarara. Hence there is a yellow scoring under the delivering pillar.

## Mbarara Shit Flow Diagram (SFD)

The Mbarara SFD revealed that an estimated 56% of the total faecal sludge produced is unsafely managed. Of this, 41% is due to faecal sludge not contained and not emptied, which is prevalent in low- income and informal settlements. Faecal sludge emptied by service providers, but not reaching treatment plants contributed 11% to the total percentage. In addition, 20% of wastewater does not reach treatment, due to blockages and overflows in the sewer network, and that the treatment plants are operating at an efficiency of 80% in removing the most relevant environmental and public health pollutants, such as BOD<sub>5</sub> and pathogens.

Containment technologies in medium- and high-income areas of Mbarara contain faecal sludge due to an identified low risk of groundwater pollution. The faecal sludge that remains in containment and is not emptied contributes 36% to the total percentage. It was estimated that 80% of the faecal sludge emptied by mechanical emptying service providers reaches treatment and the total amount of faecal sludge treated contributes 4%. Wastewater treated safely contributes another 3% to the overall outcome of 44% safely managed.



The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic. Full details on how to create and SFD Report are available at [SFD.susana.org](http://SFD.susana.org)

Figure 3: Mbarara Shit Flow Diagram

## Primary research findings

1. It is estimated that 44% of excreta in Mbarara is safely managed, 56% unsafely managed and 0.7% of the population practices open defecation. Sewer coverage in Mbarara is 5.2%.
2. Sanitation access in Mbarara Municipality is largely by traditional pit latrines, with limited connection to sewers. The study revealed that majority of the respondents (47.3%) use traditional pit latrines, 25.5% used Ventilated Improved Pit (VIP) facilities, and nearly a quarter (24.3%) reported using flushing facilities. Only 1.5% reported they had Ecosan facilities.
3. Approximately ninety-two percent of respondents flushed to a septic tank, while the rest flushed to a sewer (4.1%) and cesspit (3.1%). Further, two-thirds (66.3%) of the respondents said that septic tanks were connected to a soak pit, and 22.5% reported that their septic tank was not connected to a soak pit.
4. Majority (61.9%) of pit latrine walls were unlined, while 38.1% were lined by construction with bricks and cement mortar.
5. On average, it took 1.86 minutes to access sanitation facilities. Up to 82.4% took up to two minutes.
6. Sanitation facilities are mainly emptied mechanically using vacuum trucks or cesspool emptying vehicles. Emptying costs are high and private sector involvement in emptying sanitation facilities is low.
7. Mbarara Sustainable Urban Sanitation Action Plan (SUSAP) developed during the study highlights need for an estimated US\$ 42,824,500 for implementation over a period of five years.
8. The expenditure on sanitation as a percent of the disposable household income is way higher than the recommended value of 3-5% for sustainable WASH provision.
9. The residents of Mbarara Municipality are fairly literate, highlighting the possibility of success of educational programs on fecal waste management.
10. Landlords and tenants exist almost in equal measure, but with tenant numbers slightly higher than the landlords'.
11. Enabling environment relies on national laws/policies and legislation and there is no evidence of any local by-laws with low awareness, sensitisation and enforcement.
12. No re-use of fecal waste derived products was encountered, even though there is potential to use fecal waste products for fuel briquettes and as soil conditioners.
13. Cost-effectiveness analysis carried out shows that non-sewer sanitation service provision is at 5-10 times cheaper than the fully centralized sewer service provision in MMC.

## Recommendations for policy

### 1. Domestication of national policies and laws

Local by-laws should be developed to contextualize the national laws and legislation such as outlawing the construction of unlined latrines in Mbarara Municipality.

### 2. Pro-poor strategies

Loans or subsidies to low income urban settlements, for funding both the infrastructure as well as operation and maintenance will be critical to ensuring access to safely managed fecal waste management services for all, in line with SDG 6.2.

### 3. Stakeholder mobilization for investment in sanitation

There is need to identify, and pursue outreach and dialogue to attract more partners and stakeholders to work on FWM in Mbarara, covering the whole sanitation value chain. Incentives in the sub-sector will help address the current low private investment in sanitation, especially mechanical emptying of sanitation facilities. This will serve to increase competition, resulting in lower prices for emptying.

#### 4. Planning and coordination

There is need to incorporate sanitation planning in the overall context of urban planning, and in line with the guidelines contained in the inaugural Mbarara SUSAP. Actors should be coordinated and players identified to ensure that all of the components along the value chain are attended to. A FWM ordinance should be developed and enacted, communicated and implemented by MMC and stakeholders. MMC should not only develop a local ordinance on OSS and FWM, but to also widely disseminate, implement and enforce it.

#### 5. National and regional budget advocacy

The levels of financial investment in the WASH sector in MMC are generally low. There is an urgent need to disaggregate water, sanitation and hygiene budgetary allocations to better prioritize, and track interventions in fecal waste management. Capital projects in sanitation should be exclusively budgeted for, and increments allotted in tandem with the existing gaps in service provision.

#### 6. Technical, financial and human capacity

There is need to pursue actions to overcome the systemic challenges in low staffing levels as well as little/no resource allocation to undertake sanitation and FWM activities in MMC. In addition, treatment plants designed to treat fecal sludge or combinations of fecal sludge and wastewater should be constructed.

#### 7. Non-sewer sanitation critical to boosting coverage

Non-sewer sanitation in Mbarara costs less and more people can be reached with lower budgets as compared to attempts to link all citizens to the main sewer grid. Deliberate efforts to promote investment in non-sewer sanitation should be pursued.

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### About the African Population and Health Research Center (APHRC)

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