# Assessment of Water Service Delivery in Refugee Settlements in Uganda

## Analysis and Recommendations

October 2019

## HIGHLIGHTS

- Uganda hosts over 1.26 million refugees from neighboring states. Its receptive policy is increasingly being met with challenges of sustaining services to these populations. The pressure on water resources and infrastructure is high, and actors supporting the refugee response face a range of challenges.
- A deep dive assessment in six sites in refugee settlements has revealed user and infrastructure constraints, many of them lined to design and establishment challenges, as well as O&M, financial, and institutional challenges.
- While financial challenges directly threaten the sustainability of water supply in refugee settlements, other parameters also impact sustainability; such as, infrastructure and user challenges impact systems' sustainability by breeding general community dissatisfaction and limiting time for productive activities. Maladapted infrastructure can also result in high O&M costs which cannot be supported by affordable user fees.
- The MWE and UNHCR recently decided to speed up the process of adopting water user fee in refugee settlements, and to transition from a partner to a utility-based water service model. This aligns with national strategies to integrate refugees into long term development efforts to promote self-reliance.
- While adopting a coherent overall strategy, the MWE, OPM and UNHCR should ensure that interventions are adequate to each settlement. To guide the design and implementation of these tailor-made interventions, the institutional and policy framework around water supply in refugee settlements should be strong.

# Executive Summary

## Context

As revealed by a deep dive study of six water schemes, provision of water services in refugee settlements and host communities remained challenged. Quality – but above all the quantity – of water supply in refugee settlements is inadequate due to severe limitations of the current water systems. This impacts refugees' health, sanitation and well-being, and impacts their time and ability to engage in productive and recreative activities. This has direct implication on the economic precariousness of some refugees; despite being provided with basic goods and services (food rations, land plots, building material and core relief items and some training opportunities), livelihood and economic opportunities are reported to be poor; in turn, the ability to contribute to better water services is low. On top of water supply user challenges, sanitation challenges are also significant, especially due to the insufficient amount of water available, lack of improved sanitation facilities and the poor state of pit latrines.

Focusing on 6 motorised schemes, our study reveals that infrastructure capacity utilisation and performance could be improved, and that pressure on infrastructure is high, often because refugee flows being larger than predicted.

Key stakeholders for water supply in refugee settlements in Uganda acknowledged the need to improve services there, especially in terms of sustainability. These stakeholders include the Ministry of Water and the Environment (MWE) and associated District Water Office (DWO), local authorities, and the Office of the Prime Minister (OPM), responsible for refugee protection. A newly created MWE entity, the Refugee Response Subgroup, will serve as an entry point for all refugee initiatives, and coordinate the water sector's response to key challenges in refugee hosting districts.

To help solve challenge, the UN Refugee Agency, the UNHCR, and its implementing/operating partners will also play a critical role. The UNHCR plays a critical coordinating role, while its partners, national and international NGOs, manage water supply in refugee settlements. In some settlements, elements of community-based management are integrated to the partner model, in the form of a Water Committees/Board reporting to the partner. Partners cover both capital and O&M costs of infrastructure, often with UNHCR partial or full support. In some settlements, refugees financially contribute towards water services through user fees; however, such incidences are relatively low.

With the aim of improving the sustainability of water supply and quality of services in refugee settlements, the MWE and UNHCR recently reached critical decisions: to speed up the process of water user fee adoption in refugee settlements, and to transition from a partner to a utility-based water service model. The National Water and Sewerage Corporation (NWSC) and the Umbrella Authority (AU) therefore become key stakeholders for the sustainability of water supply in refugee settlements. NWSC is an autonomous public utility owned by the Government of Uganda, well established and providing water in over 230 towns; the UAs, as recently restructured institutions, act as decentralised units of the MWE. While other management models exist in Uganda, the NWSC/UAs models were deemed the most efficient systems to manage water supply in refugee settlements over the long run. The NWSC utility model is being piloted in two settlements: Rwamwanja and Bweyale (Kiryandongo).

The announced shift towards the adoption of user fees and towards a utility-based model is in line with the Government of Uganda's political stance to develop policies building the self-reliance and resilience of refugees (captured in the Refugee and Host Population Empowerment (ReHoPE) Strategic Framework, the Comprehensive Refugee Response Framework (CRRF) and the upcoming Water and Environment Sector Response Plan).

While there is potential for a widespread implementation of user fees, these should be implemented gradually, considering the characteristics of each settlements. An illustrative household survey undertaken in the six schemes showed that there is considerable diversity in the operational costs of water supply across different schemes, and substantial diversity in ability and willingness to pay across settlements. In light of affordability considerations, there may be more scope, in the immediate term, to increase user fees to levels that improve cost recovery in the settlements where there is already water use charging than to introduce user charges in settlements where there is no user fees. Affordability constraints will also likely guide the 'gazetting' process of water supply systems for allocation to either NWSC or the UAs.

## The Challenges

Our deep dive assessment in six sites in refugee settlements – Oruchinga, Nakivale Base Camp, Nyumanzi, Ofua 6 (Rhino Camp), Zone 4 and Swinga (Bidibidi) – has revealed a series of challenges relating to water supply and provision of services in refugee settlements.

**The context in which water systems for refugee settlement are established is fragile, dynamic and uncertain, leading maladapted systems and fragmented design**. Conflict and unrest in home countries, and refugee movements to Uganda

are unpredictable. UNHCR partners' responses to water supply needs is admirable, but not always well coordinated. The growth of population and associated water needs in refugee settlements is difficult to quantifiably foresee, and infrastructure capacity have often rapidly become inadequate. User consultation on design if often impossible, and designed systems are often financially unviable, which would become a challenge is partners' financial support to O&M was to end. Multiple partners operative in the same settlement or refugee hosting region, and there is a lack of uniform planning in water systems, which does not allow for economies of scale to decrease O&M costs. Finally, establishment challenges are heightened by some of Uganda's demographic, climate, and development trends, which put pressure on Uganda's water resources. Lack of infrastructure, climate variability, and environmental degradation hamper the country's ability to meet water demands.

**There are multiple user challenges, which result in significant consequences for the livelihoods, sanitation and health of refugee communities.** User challenges include inadequate water supply levels (below minimum standards), low reliability and intermittent supply, poor access to the water point, in particular for vulnerable groups; inadequate water storage at both scheme and household level, inadequate hygiene and sanitation, and associated health concerns. Finally, it is worth noting that user challenges are overwhelmingly carried by women, who not only face security risk, but whose water-related tasks limit their ability to engage in productive and recreational activities. User challenges breed general community dissatisfaction with water supply services, which also impacts the sustainability of water systems, as they impact users' willingness to pay for water services.

**Water supply infrastructure has proven to perform at a low capacity utilization rate and moderate performance (14-65%).** Due to a weak application of standardized performance, incomplete data capture and limited information sharing, it is challenging to precisely assess the functionality of water systems in refugee settlements, however initial findings show scope for improvement. The overarching challenge related to a lack of predictability in the number of users, has led to the adoption of systems of inadequate size and strong pressure on infrastructure.

**Our deep dive analysis has revealed a multiplicity of O&M challenges, from a lack of clarity of O&M costs and expenditure to delay in maintenance and energy supply issues**. Capital investment cost information is not publicly available, and O&M costs are poorly documented. In some settlements like Nakivale, O&M costs are high. When systems break down, delays in maintenance and repairs were reported in most sites visited. Finally, there are some energy supply challenges, especially related to the lack of reliability of solar energy leading to intermittent functioning of the pumps.

**Donor's funding and humanitarian aid (UNHCR/partners) which largely fund water supply services to refugees in settlements seem to be shrinking, with no alternative sources known.** Risks to see this funding shrink even more is particularly high as there is a push to shift to a utility-based model. The Government of Uganda is not able to increase its contribution, due to financial constraints. Refugee's financial participation to cover O&M costs is also limited by the lack of sustainable livelihood opportunities, especially for women who spend long hours fetching water. Many refugees are partially or fully reliant on development aid, and some seem to have adopted an entitlement mentality.

**The institutions playing a role in the provision of water in refugee settlements are varied, which creates institutional complexity and at times inhibit synergies**. Some stakeholders reported that the limited practice of information sharing and knowledge exchange between development partners sometimes impedes coordination. Finally, some partners highlighted the **misalignment between donor funding cycles and return on infrastructure investment**. While cycles are usually of a few years, sustainable impact is usually only properly measurable over a longer period. This misalignment can lead to partners adopting short-sighted interventions, whose sustainability is poor.

## Towards Improved & More Sustainable Water Services Delivery in Refugee Settlements

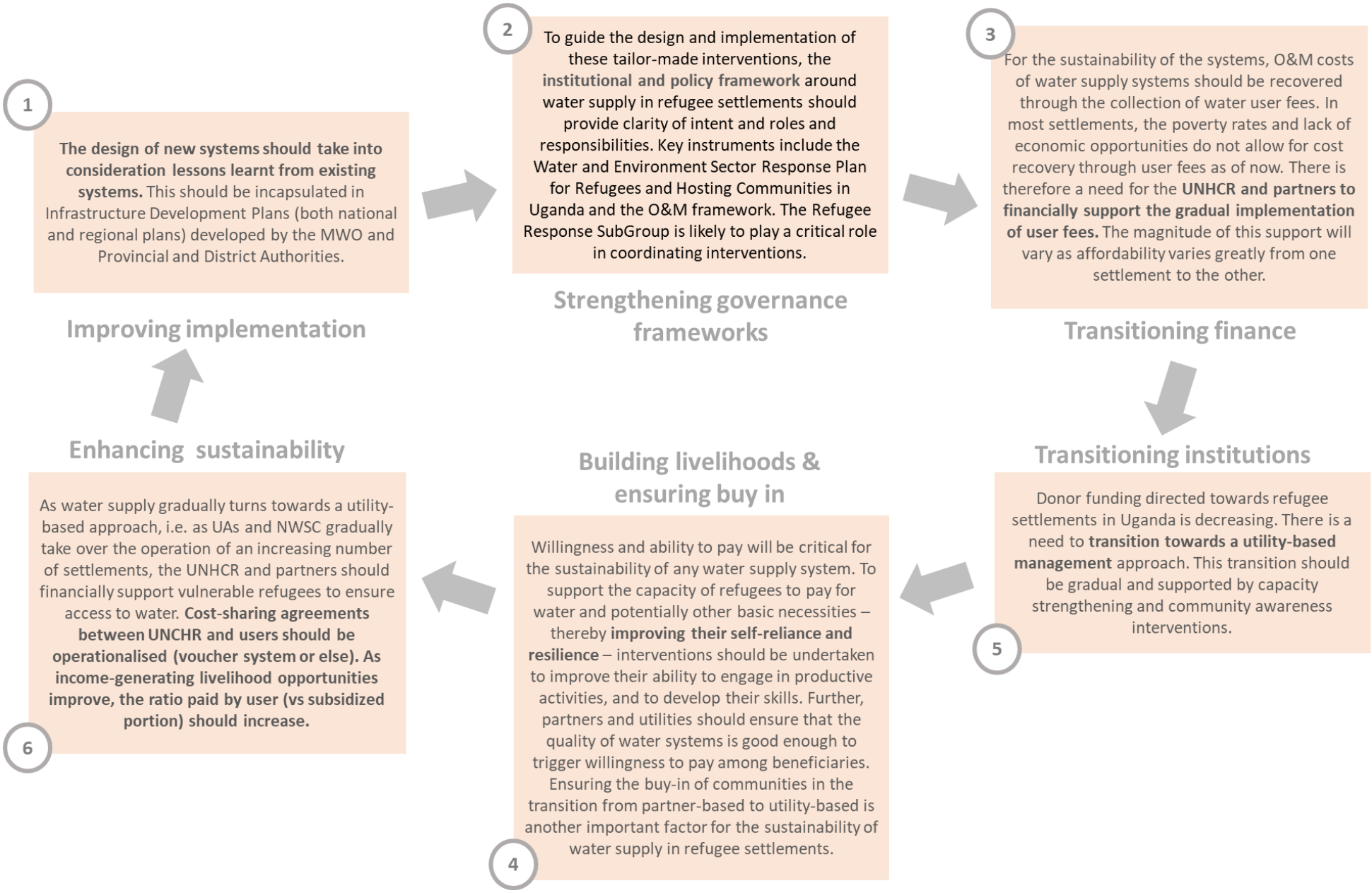
The numerous challenges identified in the six schemes should be addressed to increase the sustainability of the water systems. A sustainable water supply system would be one that meets and will continue meeting the demand of refugee populations and host communities, as this demand evolves. Further, it would be a system that provides a service that is good enough to trigger widespread willingness to pay among beneficiaries. As donors might be diminishing or withdrawing their support, to be truly sustainable, each system's water fee revenue should fully fund operation, maintenance and upgrade costs; however, because of the low revenue of refugee populations, this equilibrium between revenue and O&M costs can only be achieved through an efficient appropriate technical system with reasonable O&M costs. Finally, a **sustainable system should be fair and affordable to all, supportive of the most vulnerable refugees, supported by strong institutions and simplified through streamlined processes**. A sustainable water supply system will only be the by-product of a transition from an emergency mindset to post-emergency, long-term development focused mindset.

While the root causes and manifestation of sustainability challenges are common to many or all water schemes investigated, the adequate responses to these challenges might differ from one settlement to the other**. While adopting a coherent overall strategy, the MWE, OPM and UNHCR should also ensure that each intervention is adequate (and potentially tailored) to each settlement.** Our case studies highlight that refugee settlements throughout Uganda have different characteristics, and that the water supply systems themselves have different features (cost, technology etc.). Interventions aimed at improving the sustainability of water systems will have to be adopted gradually. **To guide the design and implementation of these tailor-made interventions, the institutional and policy framework around water supply in refugee settlements should be strong.** The detailed analysis of the six case studies and institutional study revealed six key observations, each associated with key recommendations, as summarised in the two illustrations below.

## About this Report

This report seeks to **inform the development of key national instruments such as the Sector Response Plan, the O&M Guidelines revision, as well as the Infrastructure Plan**. It also aims at **supporting the work of the Refugee Response Subgroup and its nascent Secretariat, and the gradual implementation of a water user fee in refugee settlements**. The findings and recommendations of the report will improve the efficiency and sustainability of water supply systems in refugee hosting districts, with a focus on refugee settlements. This goes hand in hand with a transition from an

emergency resolution mindset to one of post-emergency support and longer-term development. The challenges presented in the report were identified as part of a “deep dive assessment” of six zones in five refugee settlements selected UNHCR, the Ministry of Water and the Environment (MWE) and the World Bank for their differing characteristics. The breadth of the analysis and recommendations presented in this report is the result of a pluri-disciplinary approach, including three main disciplines: engineering, economic and social science.


1
The design of new systems should take into consideration lessons learnt from existing systems. This should be incapsulated in Infrastructure Development Plans (both national and regional plans) developed by the MWO and Provincial and District Authorities.
Improving implementation
2
To guide the design and implementation of these tailor-made interventions, the institutional and policy framework around water supply in refugee settlements should provide clarity of intent and roles and responsibilities. Key instruments include the Water and Environment Sector Response Plan for Refugees and Hosting Communities in Uganda and the O&M framework. The Refugee Response SubGroup is likely to play a critical role in coordinating interventions.
Strengthening governance frameworks
3
For the sustainability of the systems, O&M costs of water supply systems should be recovered through the collection of water user fees. In most settlements, the poverty rates and lack of economic opportunities do not allow for cost recovery through user fees as of now. There is therefore a need for the UNHCR and partners to financially support the gradual implementation of user fees. The magnitude of this support will vary as affordability varies greatly from one settlement to the other.
Transitioning finance
Transitioning institutions
5
Donor funding directed towards refugee settlements in Uganda is decreasing. There is a need to transition towards a utility-based management approach. This transition should be gradual and supported by capacity strengthening and community awareness interventions.
Building livelihoods & ensuring buy in
4
Willingness and ability to pay will be critical for the sustainability of any water supply system. To support the capacity of refugees to pay for water and potentially other basic necessities – thereby improving their self-reliance and resilience – interventions should be undertaken to improve their ability to engage in productive activities, and to develop their skills. Further, partners and utilities should ensure that the quality of water systems is good enough to trigger willingness to pay among beneficiaries. Ensuring the buy-in of communities in the transition from partner-based to utility-based is another important factor for the sustainability of water supply in refugee settlements.
Enhancing sustainability
6
As water supply gradually turns towards a utility-based approach, i.e. as UAs and NWSC gradually take over the operation of an increasing number of settlements, the UNHCR and partners should financially support vulnerable refugees to ensure access to water. Cost-sharing agreements between UNCHR and users should be operationalised (voucher system or else). As income-generating livelihood opportunities improve, the ratio paid by user (vs subsidized portion) should increase.

### Improving Implementation

- The Infrastructure Development Plans to advocate for the adoption, in refugee settlements, of flexible and transitionable design of new infrastructure which allow for "plug in" of additional components to adapt to the demand.
- Infrastructure Development Plans to advocate for the decentralisation of water supply design to ensure good performance for both regular and intermittent supplies.
- MWE to ensure that the appropriate entities are equipped with capabilities to undertake a good streamlined review process of the technical designs in settlements before establishment to ensure alignment with government guidelines.

### Strengthening governance frameworks

- Refugee Response SubGroup to help bring clarity to the institutional architecture of water supply in refugee settlements (incl. facilitating coordination, reporting, knowledge sharing, updating provisions).
- MWE to ensure that the Water and Environment Sector Response Plan for Refugees and Hosting Communities in Uganda integrates key lessons learnt from and lays the foundation for the transition towards a utility-based system.
- MWE to provide more clarity and directive around the allocation of schemes between NWSC and the UAs.
- O&M framework to include: a set of performance indicators specific to refugee settlements; provisions for regular assessments on systems efficiency; cost-cutting recommendations; guidelines on community engagement.
- MWE to ensure that the appropriate entities – including local government and DWO – are equipped with enforcement capability to ensure compliance with key policies and performance indicators.

### Transitioning finance

- UNHCR to classify settlements according to their ability to pay for water services.
- Gradual adoption of water user fees, firstly in settlements where ability to pay is high and cross-subsidization is possible (category 1).
- Where user fees already exist, UNHCR and MWE to investigate the potential scope for an increase of user fees, until O&M costs are fully covered.
- Where there is no user fee, and that the ability and willingness to pay is low, partners to introduce a small "symbolic payment" to stimulate the culture of paying for water.
- UNHCR, partners, MWE and utilities to continuously assess the potential for cross-subsidisation.
- MWE, OPM and UNHCR to jointly investigate the potential of cash-based incentives based on a minimum expenditure basket.
- OPM, with the support of other relevant ministries and of the UNHCR, to explore the integration of refugees into national social protection schemes.

### Enhancing sustainability

- MWE, with the support of donors, to undertake an assessment of capacity gaps and capacity strengthening needs for UAs/NWSC.
- MWE/international donors to provide continuous institutional strengthening support to NWSC and UAs.
- UNHCR to work in collaboration with local authorities on triggering the gazetting process, considering service affordability, robustness and sustainability.
- When negotiating an MoU with a utility, UNHCR to consider lessons learns from other similar negotiations; Negotiations to be context specific and allow of future amendments.
- OPM to define role as permanent backstopping entity.

### Building livelihoods & ensuring buy in

- UNHCR and MWE to undertake regular ability and willingness to pay assessments.
- UNHCR to coordinate the livelihood interventions of its partners in refugee settlements. GoU to assist in establishing a socio-economic development policy in refugee hosting settlements.
- Where feasible, local authorities and the DWO to allow refugees and host communities to use hand pump for productive activities.
- When possible, transition from partner-based to utility-based system to be introduced after system upgrades.

### Transitioning institutions

- UNHCR to investigate and pilot different approaches to the operationalisation of cost-sharing agreements for voucher system.
- UNHCR, MWE and OPM to join efforts in demonstrating the higher value for money of a subsidised utility system.
- Transition to a utility-based system to be done as a result of an engagement with the refugee community and a sensitization process.
- Local governments in refugee hosting districts and utilities to continuously engage to ensure that interventions are aligned with provincial and district plans.
- Utilities, with MWE, to continuously assess the possibility for cross subsidisation and rebalance tariff.

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*Pictures credit: Cindy Helfer*

# LIST OF ABBREVIATIONS

| | |
|---|---|
| CCRF | Comprehensive Refugee Response Framework |
| CFGD | Community Focus Group Discussion |
| DAR | Development Assistance for Refugee-Hosting Areas |
| DRC | Danish Refugee Council |
| IP | Implementing partner (UN-funded) |
| KII | Key informant interview |
| LWF | Lutheran World Federation |
| M&E | Monitoring & evaluation |
| MWE | Ministry of Water and Environment |
| NWC | Norwegian Refugee Council |
| NWSC | The National Water and Sewerage Corporation |
| OP | Operating Partners (receiving funds from other actors than the UN) |
| O&M | Operation and maintenance |
| PPP | Purchase price parity |
| ReHoPe | Refugee Host Population Empowerment |
| STA | Settlement Transformative Agenda |
| UNHCR | United Nations High Commissioner for Refugees |
| UA/UAs | Umbrella Authority/Umbrella Authorities |
| WASH | Water, sanitation and hygiene |
| WSS | Water Supply and Sanitation |

# 1 Introduction

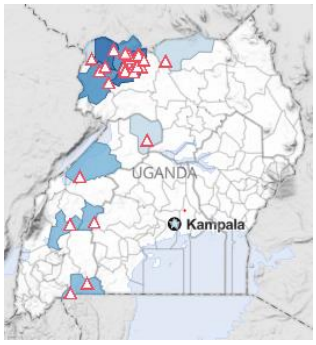
*Uganda hosts over 1.26 million refugees from neighbouring states. This progressive policy is increasingly being met with challenges in sustaining services to these populations. The pressure upon water resources and infrastructure is significant, and actors supporting the refugee response, including water service providers, face a range of (coordination, planning and accountability) difficulties. There is a need to adjust the approach from one of humanitarian response to a more comprehensive and forward-looking refugee response that is integrated with national developmental priorities; however, this does not come without challenges.*

*The present report aims at informing the development of key instruments such as the Sector Response Plan, the Operations and Maintenance (O&M) Guidelines, as well as the Infrastructure Plan. It also aims at supporting the work of the Refugee Response Subgroup and its nascent Secretariat.*

*This introductory chapter details the objectives of the assignment and provides a review of the context, key actors and root causes of water provision challenges in refugee settlement in Uganda. It concludes with an overview of the methodology used to gather primary data in six refugee settlements, as the basis for an analysis of challenges and set of recommendations presented in the following chapters.*

## 1.1 Study origination: tackling infrastructure challenges in refugee settlements

Uganda is the largest refugee hosting country in Africa and the third largest in the world (GoU and UNHCR, 2017). The number of refugees has been in constant growth over the last few years (**Error! Reference source not found.**), and as of July 2019, Uganda hosted over 1,33 million refugees (UNHCR, 2019).



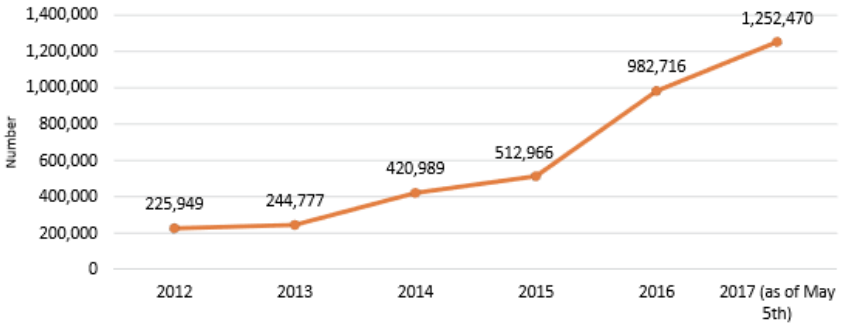




*Figure 1 Map of refugee settlements and refugee hosting districts in Uganda (left) and number of refugees in Uganda per year (right) Source: (UNHCR, 2019)*

At the heart of this receptive philosophy may be the fact that over recent decades many Ugandans have also experienced exile from their homeland, and as such have an understanding of the plight of these communities (BBC, 2016).[1]

Uganda takes in refugees from South Sudan and DRC (respectively 68 and 25% of the refugees hosted in Uganda), but also from Burundi, Somalia, Rwanda, Eritrea, Sudan and Ethiopia (UNHCR, n.d.) (Figure 2). Many of them are hosted in 27 refugee settlements (UNHCR, 2020), where they stay for extended periods of time, often years.[2] Uganda's policy regarding refugees is increasingly being met with challenges in sustaining services to these populations, which comes with the associated risks of adequately meeting their basic human needs. This is particularly complex in some geographies as some of the refugee hosting districts are located in water scarce areas and dry cattle corridors (e.g. Isingiro, Kamwenge and Kyegegwa Districts).

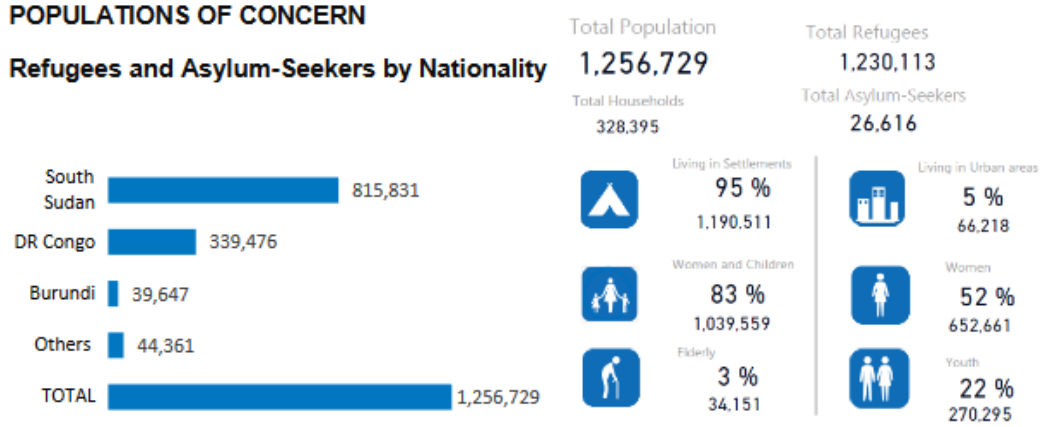



*Figure 2 UNHCR Data on the populations of concerns, April 2019 (UNHCR, April 2019).*

Infrastructure in refugee settlements, such as water supply systems, is installed by humanitarian aid institutions in times of emergency, often on an *ad hoc* basis and without proper O&M plans in place. In many instances, refugees are tending to view these settlements as being more permanent in nature and hence, these settlements tend to develop organically at a rate that is beyond spatial planning competencies. This expansion impacts upon infrastructure O&M regimes as well as placing considerable pressure upon authorities to expand services. With high numbers of asylum-seekers arriving in Uganda each year, the pressure on basic resources, including water, land and energy is increasing rapidly, with increasing uncertainty as to what extent the current infrastructure is adequate to support these burgeoning communities.

There are currently large discrepancies in refugee settlements in terms of the level of water services received, and payment for these services. Moreover, there are almost 40 water, sanitation and hygiene (WASH) service

1After the 1962 independence, the current President and several cabinet members had to flee Uganda to go in exile.

[2] The typical journey of a refugee in Uganda is characterized by an entry phase (1-3 days at a reception centre), settlement and integration phase. During the settlement phase, land for residential and agricultural use is allocated to refugees. During the integration phase, refugees can access various services, including education, healthcare, water, security and protection and agriculture extension services. (UNDP, 2017)

providers[3] suppling refugee settlements.[4] While all providers are overseen by the UNHCR, their services are not always well-coordinated, nor do they follow an integrated approach. Some services fall short of appropriate standards and do not comply with Ugandan and international standards for infrastructure development. Likewise, there is little to no coordination on the many water supply and sanitation facility interventions planned in refugee settlements.[5] The lack of an integrated WASH approach in settlements is explained both by the limited information sharing and knowledge exchange among the development partners and implementing agencies, and by the lack of standardised guidelines for WASH interventions in Uganda.

Considering the pressure of migration flows on existing infrastructure, and associated risks of water borne diseases and general public health concerns, improving and sustaining water services in refugee settlements in Uganda is critical. A decline in WASH service standards (also affecting health care services) can pose serious health challenges, including the risk of cholera epidemics, as previously experienced.[6]

In the face of regional economic and political instability, Uganda has chosen to adopt refugee-friendly policies which provide refugees with the right to education, work, private property, healthcare and other basic social services (Amnesty International, 2017). Noting the longer-term nature of many of these settlements, the provision of water services can also have a direct impact on livelihood opportunities and the time available to communities for productive activities. Similarly, these impact upon recreational activities as well as supporting sustainable education. At the more strategic level, beyond addressing the plight of these communities on the ground, it is also important to note that ensuring the efficiency of water supply technology in refugee settlements is crucial to supporting Uganda in achieving the sustainable development goals as well as reducing the cost borne by Uganda to sustainably meet the longer-term needs of refugees.

## 1.2 Defining the report's primary objectives

This report provides our case studies-based analysis and recommendations and is expected to **support the ongoing efforts of the Government of Uganda to improve sustainable of water supplies in refugee settlements**. It is envisaged that the report will serve as a key information repository for the elaboration of new policies and the implementation of new interventions relating to water supply in refugee settlements.

In more detail, the present report is expected to inform:

- the work **the Refugee Response Subgroup and its developing Secretariat**: The newly established Subgroup, associated to the Ministry of Water and the Environment (MWE), is expected to play a key role in shaping policies and interventions in refugee settlements and refugee hosting districts. It is

[3] This numbers varies with implementation partners coming and going.
[4] For a total of 148,378 water schemes and sanitation facilities completed.
[5] A recent study cited 326,864 interventions (World Bank, RFP for Assessment of Water Service Delivery in Uganda Districts Hosting Refugees)
[6] In 2018, cholera broke out in a settlements hosting DRC refugees, resulting in over 40 deaths.

hoped that this report will provide the Subgroup with information and recommendations to enable their decision-making processes.

- the elaboration of **the Water and Environment Sector Response Plan for Refugees and Hosting Communities in Uganda**: the Water and Environment Sector Working Group decided to draft a Sector Response Plan to respond to challenges around water supply in refugee settlements in a coordinated and integrated manner, and to manage limited resources efficiently. This came as a response two factors. Firstly, 12 hosting districts have become constrained in terms of water and sanitation service provision and water and environmental resources availability and management. The MWE reports that refugees have had an impact on the environment, through uncontrolled housing development, and by undertaking agricultural and other small-scale livelihood activities that affected the natural environment.[7] Secondly, a significant number of water-related interventions were planned,[8] but these were not well-coordinated and led to varying degrees of environmental degradation (MWE Permanent Secretary, 2018). The Sector Response Plan takes a catchment or basin management approach and is organized according to strategic priorities.[9] The plan seeks to achieve four objectives around capacitated institutions, service provision, environmental protection and sustainable management of water and national resources (MWE Permanent Secretary, 2018).[10]
- the elaboration of **the Infrastructure Development Plan for the West Nile region**: the MWE has commissioned an infrastructure development plan for that refugee-hosting region, which will review the availability of, and demand for, water resources. The above-mentioned Sector Response Plan is expected to support the Infrastructure Development Plan and alignment between these two instruments will be important.
- the revision of the **O&M framework for water supply and sanitation**: this country-wide framework is currently being revised by the MWE, and it is envisaged that this report informs this revision process, especially pertaining to the design of user fees applicable to refugee settlements and host communities.
- the **implementation of the UNHCR, OPM and MWE's decision to charge water user fees** in exchange for service delivery in refugee settlements. This decision, taken in early 2019, is motivated by a number of factors including the developmental objective to see refugees and the host population (citizens of

[7] As such, the most significant problems associated with the refugee-affected areas are deforestation, soil erosion, poor waste management and depletion and pollution of water resources.
[8] As of May 2018, over 37 Partners were involved in the refugee emergency responses in the WASH & Environment sectors, and over 190 water supply interventions were planned (to complement the 1,315 completed water schemes).
[9] Three strategic priorities are listed: 1) all refugee responses should cater for the host communities; 2) priorities will be reviewed annually; 3) the plan will contain emergency, short and long-term planning (MWE Permanent Secretary, 2018).
[10] In more details, these are the four objectives of the Response Plan: 1) institutional strengthening for the effective management and provision of water, sanitation and environmental services at the national, regional and lower levels of governance 2) to provide sustainable water, sanitation and hygiene services to refugees and host communities, including the vulnerable and disadvantaged groups; 3) to protect environment and natural resources and ensure sustainability of all water and environment interventions in the refugee settlements and host communities, through the adoption, promotion, and implementation of efficient strategies and management methods; and 4) to ensure availability and sustainable management of water, sanitation and natural resources for improved livelihoods and self-reliance for all, while reducing inequalities between refugees and host communities.

Uganda) access water services under the same terms and conditions, the implementation of tariffs would support the sustainable provision of water supply systems and the delivery of water services, at a time when long term donor funding is uncertain and volatile, and to stimulate self-reliance among refugees.

The goal of **improving the efficiency and sustainability of water supply systems in refugee hosting districts, with a focus on refugee settlements**, is important for enabling sustainable WASH practices among refugees and host communities. This in turn helps promote general public health, water-based livelihoods, sustainable education (especially for young girls), as well as improved infant nutrition. Importantly, improved water supply services would limit the time spent by women and girls fetching water, allowing more time for both income-generating and recreational activities for women, as well as more time in school for girls (Figure 3).

Core to the identified objectives was the need to **transition from an emergency resolution mindset to one of post-emergency support and longer-term development**. This is in accordance with recent agreement between the UNHCR, the Office of the Prime Minister and the MWE that humanitarian assistance should transition from emergency response toward long-term sustainable development solutions.

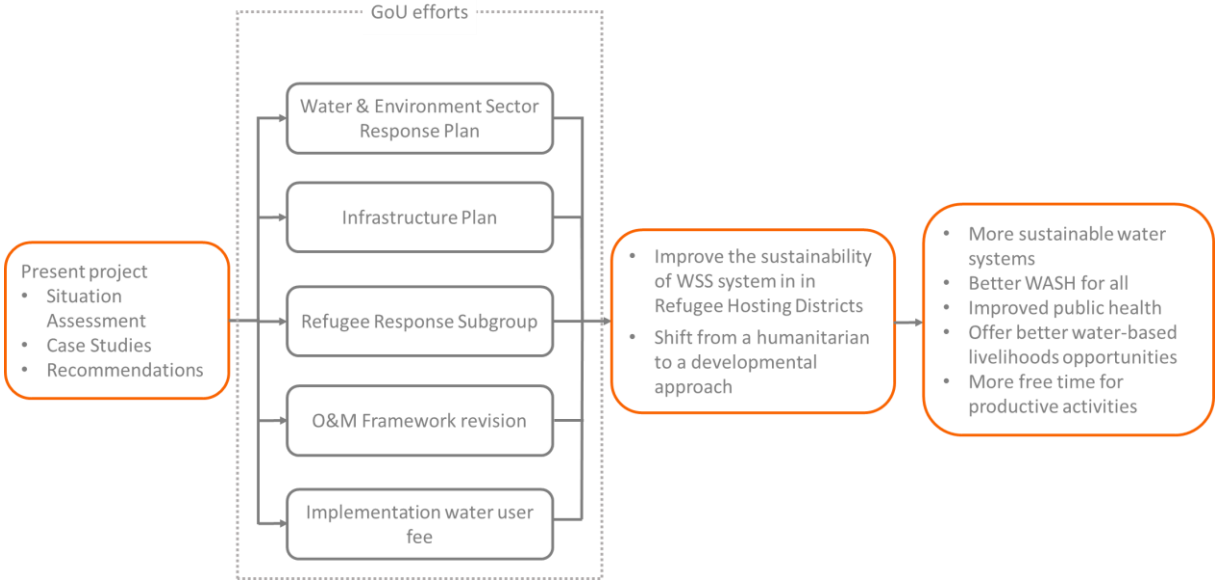



*Figure 3 Representation of the objectives of this report*

## 1.3 Our approach

To ultimately provide suggestions to improve the efficiency and sustainability of water supply systems in refugee settlements in Uganda, this project undertook a review of case studies in six specific zones in refugee settlements, where key challenges were identified. Each zone is covered by one specific water scheme. This sub-chapter presents the sample of water schemes, and describes the data gathering process undertaken in each settlement.

### 1.3.1 Selected water schemes: Oruchinga, Nakivale Base Camp, Nyumanzi, Ofua 6 (Rhino Camp), Zone 4 (Bidibidi) and Swinga (Bidibidi)

Advised by the UNHCR, the MWE and the World Bank selected six zones in five refugee settlements throughout Uganda for the case-study assessment. These were selected for their **differing characteristics in terms of system design, O&M costs,[11] O&M cost recovery,[12] implementing partners, number of beneficiaries, time of establishment, size and geographical location (region, proximity to urban centres)**. Figure 4 illustrated some of the of these differing characteristics. For example, evidence suggests that variability in O&M costs seen across these sites reflects the broader pattern across all refugee Ugandan settlements, rather than just being a function of the small number of settlements in the sample.[13]

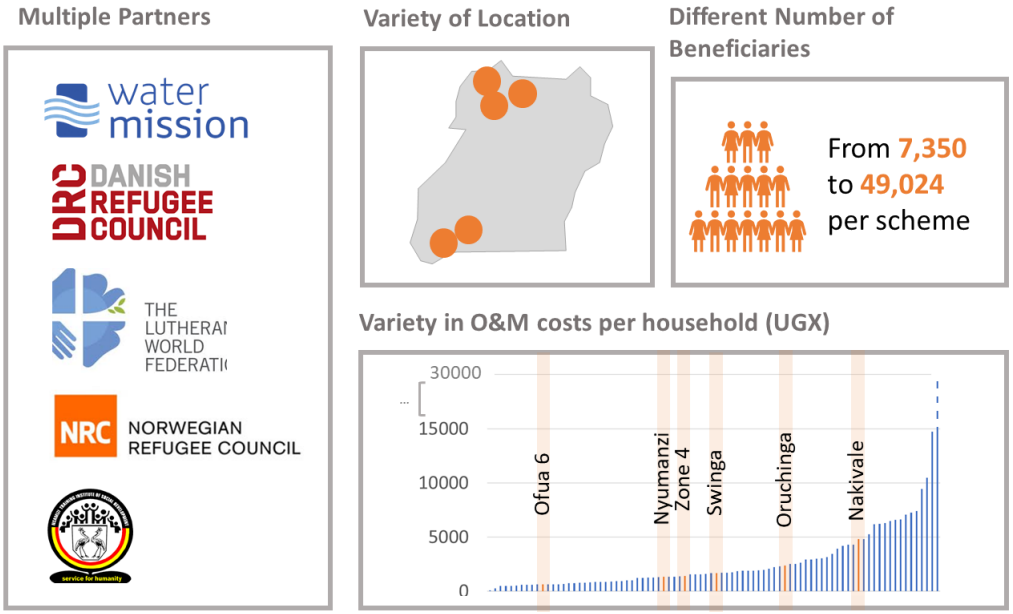



*Figure 4 Variety of refugee settlements in sample: some examples. Refugee settlement and associated data are represented in orange*

The sample is therefore relatively representative of refugee settlements in Uganda. The six zones selected from the five refugee settlements were: Oruchinga, Nakivale Base Camp, Nyumanzi, Ofua 6 (Rhino Settlement), Zone 4 (Bidibidi) and Swinga (Bidibidi) (Figure 5).

The water supply systems and services in each zone were investigated during field visits undertaken during the period of April 1-10, 2019. From these field visits, the project team has developed six water supply services case studies, presented in a Field Report. For each water scheme, the Field report provides general information about the wider settlement and socio-economic data on refugees in the settlement and scheme zone, and describes the water supply system (infrastructure, technology etc.), O&M requirements and costs, the operating partner

[11] The variability in O&M costs seen across these sites reflects the broader pattern across all Ugandan refugee settlements
[12] The household charge required for full O&M cost recovery in the six sites of focus appear to be drawn from across the spectrum of charges in other Ugandan settlements.
[13] This is based on UNHCR data.

and institutional landscape. It also provides an assessment of water quality and quantity, the involvement of communities (through user fee for example), users' willingness to pay, sanitation and hygiene and the relationship between refugees and the host communities (understood as the community living in proximity to refugees).[14] Finally, each case study also describes water supply challenges and best practices.

### 1.3.2 Data gathering phase

The report is based on both primary and secondary data. To gather primary data, the project team went to the six selected refugee settlements, and undertook a series of community focus group discussions (CFGDs), key information interviews (KIIs), as well as a small scale household survey to gather more individual data about refugees, and complement the data collected through CFGDs and KIIs. A short description of each tool is provided below. The data gathering tools are also available in annex of the Field Report, together with a timeline of the field visit and list of interviewees.

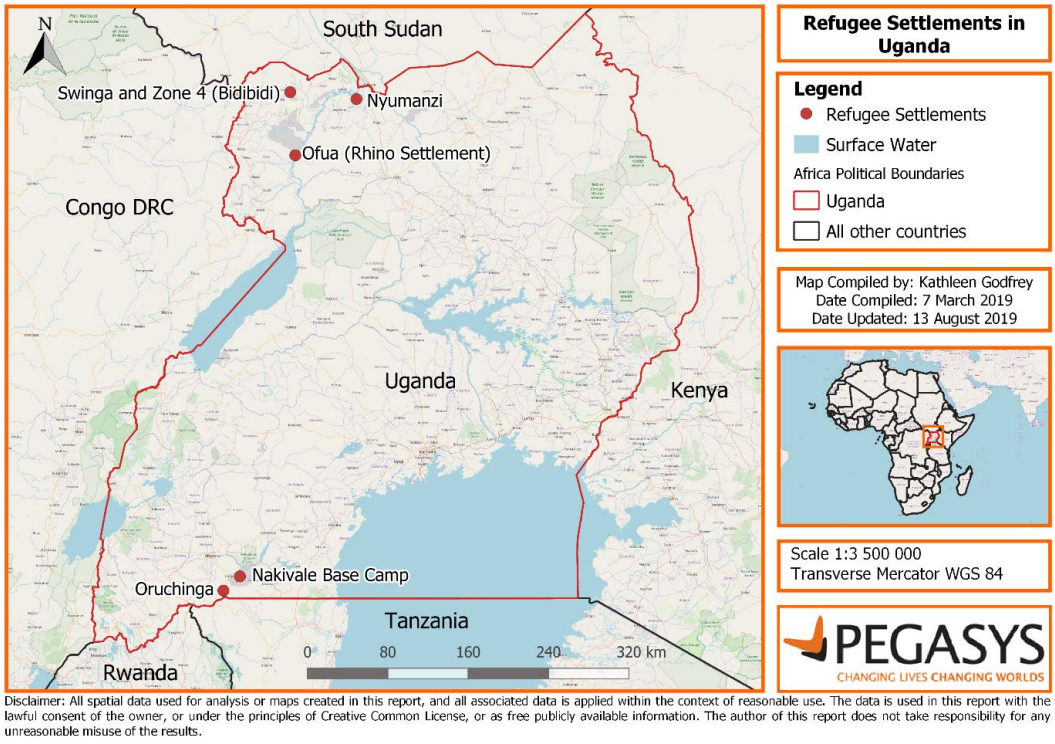



*Figure 5 Map of the six zones in five refugee settlements*

#### Community Focus Group Discussions

Three CFGDs were undertaken per zone investigated in this study, comprising: 1) refugee women and girls; 2) refugee men and boys; 3) host community members, or a mixed group comprising members of the host

[14] We understand that the GoU defines the host community as all Ugandans living in refugee hosting districts. However, due to time constraints, the team focused its attention on communities living in refugee settlements or in proximity of these settlements.

community and refugees.[15] Interviewing different groups provided an opportunity to disaggregate data and perspectives by gender and vulnerability. Each CFGDs comprised between 12 and 20 participants. Due to the demographic representation of refugees, in the North, the discussions were conducted in English, and in the South, in French (except for discussions with the host communities, which were led in English). In each group, a translator speaking the language(s) of the refugees and local language of the host community was appointed for the individuals which were not able to answer in English or French (in most cases, the water provider had appointed a translator prior to the discussions).

### Key informant interviews

KIIs were undertaken in each regional UNHCR office (Arua, Yumbe, Adjumani, and South West) and with the service provider operating the water system in each zone investigated. Further, other relevant actors at the national level, such as a representative of the MWE, were interviewed.

### Household Surveys

To complement the information collected through the CFGDs and KII, a household survey on water consumption and livelihoods was designed and administered. The project team hired local enumerators to administer the survey, all of which were recommended by the UNHCR or the water service provider. The enumerators were briefed prior to data gathering to ensure that the enumerators were clear as to the requirements of the survey, to ensure the data gathered was of sufficient quality. When possible, the enumerators undertook studies in multiple settlements. The enumerators were dropped at different geographical locations in each zone/settlement to gather different perspectives.

In undertaking this survey there was the need to find an appropriate balance between ensuring that key indicators are estimated with adequate precision (statistical validity) whilst endeavouring to get a statistically valid sample with limited programmatic resources. As this survey was a means to complement the CFGDs and KIIs,[16] our aim was to reach a sample size that would allow for a precision of 10%, which can be used for this type of household survey, and a confidence level of 90% (Table 1).[17]

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[15] This depended on the geographic distance between refugees and hosts; where refugees and host groups were living very close, we decided to have a mixed group. Where host communities and refugees were geographically distant, we interviewed host communities separately from refugees. Where refugees and hosts worked together in water committees, such as Oruchinga, we opted for a mixed group.

[16] The Household Survey was not part of the TOR and was proposed by Pegasys as a way to strengthen the analysis.

[17] A precision of 10% can be used for this type of household survey. While a 5% is usually considered as insufficient for intra-settlement comparison, it is sufficient for an inter-settlement comparison, which will be sufficient for the purpose of our study. According to the UNHCR's WASH KAP Survey Module, under normal conditions, assuming a prevalence of 50%, the most common sample sizes for simple random sampling are the following: 360 households for random sampling with 5% precision; 100 households for random sampling with 10% precision; The sample size calculated must then be adjusted to the settlement population (total number of households in that settlement). In very large settlements, adjusting the number has little impact, however in smaller settlement (less than 5'000 households for example), it will reduce the sample size (UNHCR, 2017).The UNHCR recommends using a prevalence of 50%, meaning that the answers to one question is expected to be in general evenly spread (e.g. 50% no and 50% yes, for that specific question).

*Table 1 Sample Size*

| Settlement | Registered Population (date) | Households (date)[18] | Ideal sample size for (UNHCR calculator) | Ideal sample size (Qualtrics.com) | Surveys collected |
|---|---|---|---|---|---|
| **Oruchinga** | 7,350 | 1,225* | 93 | 65 | 49 |
| **Nakivale (Base Camp)** | | 12,982 | 100 | 68 | 52 |
| **Nyumanzi** | 36,000 | 6,000* | 99 | 67 | 49 |
| **Ofua 6** | 26,145 | 7,070 | 99 | 67 | 47 |
| **Bidibidi Z4** | 31,297 | 5,216* | 99 | 67 | 49 |
| **Swinga** | 49,024 | 8,473 | 99s | 68 | 49 |

*UNHCR: confidence interval: 95%, Precision: 10%, Expected prevalence: 50% Non-response rate: 3%; Quantrics.com: confidence level: 90%, Margin of error: 10%*

Due to the project's time and resources constraints, it was not possible to reach this determined level of precision and confidence; however, the survey provides valuable data that complements the data gathered as part of the CFGDs.

[18] When household data was not available, the project team used the assumption of an average of 6 people per household as suggested by relevant literature (The WB, UNHCR and the Government of Uganda, 2016). Marked as *.

# 2 Setting the Scene for Water Supply in Refugee Settlements and Hosting Districts

*Before analysing the six-settlement case-studies in detail, this section provides an overview of the status of water supply in refugee settlements and hosting districts, presenting key actors, management models, water supply systems, state of sanitation, key financing, and recent developments. Discussing the provision water supply services for both refugees and hosting communities is critical in understanding disparities that may exist between these communities and is indicative of the steps required to address more equitable service provision and conditions. This is a key part of the MWE's strategic approach to water services.*

## 2.1 Institutional landscape: water supply in Uganda

### 2.1.1 Governmental actors

The **Ministry of Water and Environment (MWE)** is responsible for determining priorities, setting policies and standards for water development, and regulating water resources activities and WSS services (The World Bank, 2018). The current focus of the MWE is to consolidate and fully implement IWRM across the country by strengthening strategic planning instruments, improving information systems, and implementing catchment management plans. MWE coordinates with other sector partners through the WASH forum to ensure improved delivery. The MWE is also involved in the review process and approval of designs and plans for infrastructure (both inside and outside refugee settlement) (GIZ, May 2019).

In May 2019, MWE signed a Memorandum of Understanding (MoU) with UNHCR covering water, sanitation and environment, laying the foundation of engagement with the government line ministry and its agencies, including the National Environment Management Authority, the National Water and Sewage Company (NWSC) and the National Forest Authority (UNHCR, 2019).

The MWE's involvement with water supply in refugee settlements was also made evident by the efforts invested (in partnership with UNDP and UNICEF) in developing the **WASH and Environment Sector Response Plan for Refugees and Host Communities** (often referred to as the **Refugee Response Plan**), which was scheduled to be launched in July 2019 (UNHCR, 2019). The drafting of this plan is overseen by a Steering Committee, composed of key actors for water in Uganda, and important UN institutions operating in refugee settlements in the country.[19] This Plan is part of Uganda's roll out of the Comprehensive Refugee Response Framework (CCRF).

[19] The Steering Committee members are as follows: NWSC, UNMA, NFA, NEMA, NEW, OPM (incl. CCRF Secretariat), MoLG, UNHCR, UNICEF, UNDP, WB, AfDB, EU/ECHO, KfW, GIZ, ADA, UWASNET, DANIDA

The MWE is playing an increasingly important role in refugee settlements and this is being realised through the creation of the **Refugee Response Subgroup**, within MWE. This subgroup will serve as an entry point for all refugee initiatives and will coordinate and monitor the water sector's response to key challenges facing refugee hosting districts. The work of the Subgroup will be aligned with the sector Response Plan that is currently being drafted. The Subgroup is expected to anchor refugee response within the MWE and the Director of Water Development (DWD) and to build synergies between the national water development strategies and strategies to improve water supply to refugee settlements, thereby addressing long standing coordination problems. The Refugee Response Subgroup was approved in May 2019 by the Water and Environment Sector Working Group,

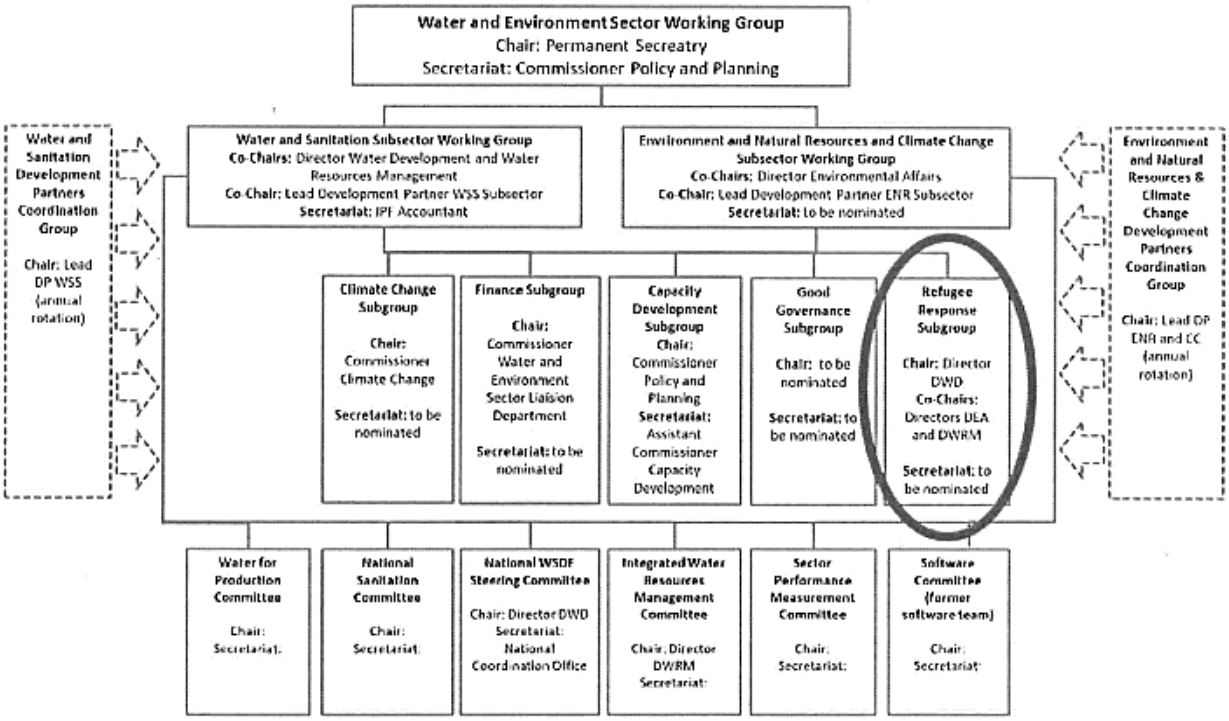



*Figure 6 Arrangements for the Water and Environment Sector Working Group and associated Subgroups*

under which it will reside. It is planned that the Subgroup will be co-chaired by the DWD and the Director for Environmental Affairs (DEA) (GIZ, May 2019).

*Source:* (GIZ, May 2019)

As a lead agency in the water sector, the **MWE/Directorate of Water Resources Management (DWRM)** has a shared responsibility with the **National Environmental Management Authority Law (NEMA)** for: water quality standards; standards for discharge of effluent into water; limits on the uses of lakes and rivers; management of riverbanks and lake shores; restriction on the use of wetlands; and management of wetlands. The sustainability of water resources provides the basis for water resource development and the provision of water supply and is also indicative of the requirements for the sustainable operation and maintenance of facilities (Nabide, 2018). Noting the pressures being placed upon the water resources and ecological infrastructure of Uganda, the

regulations and standard laid down by these regulatory bodies are important in terms of limiting the impacts of resource developments.

The **Office of the Prime Minister (OPM)** is responsible for a range of refugee management and protection interventions in Uganda.[20] Amongst other tasks, the OPM is empowered to "coordinate development of capacities for prevention, preparedness, and response to natural and human induced Disasters and Refugees" (Government of Uganda, 2018). The OPM is responsible for domestic resources investment in the protection, management and social integration of refugees and Ugandan communities that host them. The OPM Department of Refugees (DOR), with the support from the UNHCR, coordinates activities and service provision to refugees by all stakeholders, including UN Agencies, NGOs, CBOs, Faith Based Organizations and other relevant humanitarian actors. At district level, OPM is represented by the **Regional District Office** (**RDO)**, who is responsible for oversight, coordination and monitoring of refugee programs on behalf of the central government.

**District authorities** in refugee hosting districts also play a role in water supply in refugee settlements and are mandated to provide water as well as operate and maintain facilities. The **District Water Office (DWO)**, a sub-structure of the MWE, takes the lead in the implementation of all the water and sanitation activities at district level.[21] Further, the DWOs co-chair WASH sector meetings at the settlements level (GIZ, May 2019). DWOs usually include within their staff a WASH specialist, who has a role to play during those meetings and in refugee settlements.

The Settlement Transformative Agenda (STA) promotes a district level approach in refugee management. It is reported that districts have now started to integrate refugee WASH needs in District Development Plans (DDPs), which was not the case in the past. Some regional infrastructure development plans are also expected to focus on host communities and refugee settlement; in the West Nile region, a regional planning tool is in the process of being developed.[22]

**District Water and Sanitation Coordination Committees (DWSCCs)** gather political leaders, technical experts and NGO or civil society representatives at the district level. The DWSCC oversees the implementation of water supply and sanitation programmes and ensures that the water sector collaborates with other relevant sectors, and with the private sector, NGOs and the civil society (MWE, 2013).

[20] As per Article 189 under the sixth Schedule of the Constitution of Uganda, refugee management and protection is a centralized government function. This is operationalized in the Refugee Act of 2006 that states that the responsibility for the overall coordination and refugee response lies with the OPM (Part III of the Refugee Act) (WERRRP, Vol 1).

[21] That includes planning; initiation and supervision of crosscutting and sustainability issues; procurement; contract management; supervision of contractors; capacity building; ensuring O&M of water and sanitation facilities by WUGs; monitoring; participate in disaster management (MWE, 2013).

[22] The "Bulk Water Supply and Sanitation Infrastructure Development Plan for Host Communities and Refugee Settlements in Uganda's West Nile Region and Adjumani", or "WatSan IsDP West Nile".

**Local Governments (LGs)**, comprising Districts, Town Councils, and Sub-Counties, have the mandate and responsibility for planning and implementing water and sanitation sector activities for their communities.[23] Together, LGs and the MWE appoint and manage private operators for all piped water schemes that are outside the jurisdiction (MWE, 2013).

The central role of local governments in refugee hosting districts in the realization of a comprehensive response is widely recognized. Therefore, when it comes to working to address the challenges faced in refugee settlements (planning, monitoring, budgeting interventions), it is reported that the government has lately tried to strengthen the role of local governments. This move towards capacitating local governments to take more responsibility and action in refugee settlements has been supported by donors (GIZ, May 2019).

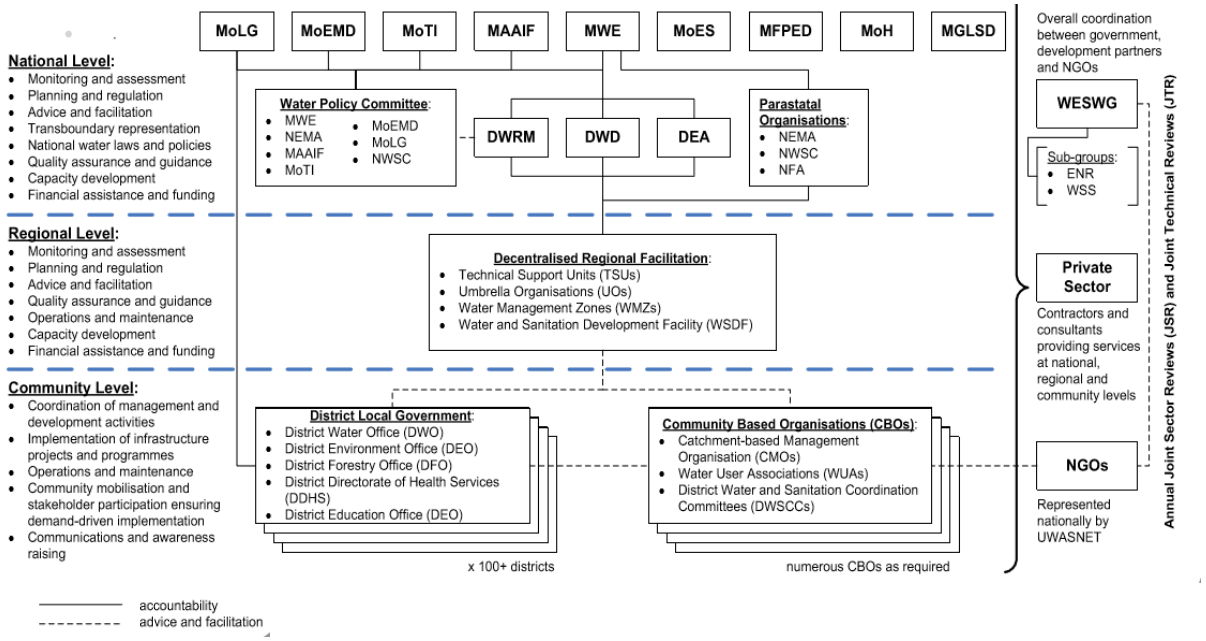



*Figure 7 Institutional landscape for water services (MWE Permanent Secretary, 2018)*

### 2.1.2 UNHCR and implementing partners

The **Office of the United Nations High Commissioner for Refugees** (UNHCR) plays a prominent role in protecting those defined as persons of concerns: refugees, asylum-seekers, stateless people, some internally displaced people and returnees (UNHCR, 2014). In Uganda, the UNHCR supports the Office of Prime Minister in leading and coordinating the refugee response, along with District Local Governments. The UNHCR mobilises resources to support the strategies and comprehensive response plans for refugee-hosting areas developed by ministries. These include plans in education, water delivery and infrastructure, environment and energy, healthcare, as well as employment and livelihoods strategies. The UNHCR, just like other UN bodies (UNICEF, UNHCR, OCHA and IOM), play a hybrid role between donor and implementing partners.

[23] LGs are empowered by the Local Governments Act (1997) to provide water services and manage water resources.

As will be discussed in detail under section 2.2.1, **Implementation and Operating Partners**, both local and international, are central to the delivery of water services in refugee settlements.

Coordination between different actors (government, UNHCR, and partners) is managed through different platforms and meetings at settlement, regional and national levels. Most of these meetings include the water service provider, the UNHCR, the OPM and the district officer, and, at the national level, the MWE. Some meetings also include other partners such as the UNICEF or relevant NGOs. At the sectoral level, the monthly WASH forum platform brings together the MWE with UN agencies and NGOs to enhance coordination between humanitarian and development actors and align approaches in settlements with government policy (Brown & van den Broek, 2018).

### 2.1.3 Community members

Further, **community members** are another key actor for water services. In many refugee settlements, **water user committees** have been set up to assist the water provider. While some committees are trained to operate each of the point water sources and the collection point for the piped water supplies, the roles and responsibilities of most committees is often limited to crowd control during the collection of water. Moreover, a few refugees have also been trained by IP/OP and district local governments as **hand pump mechanics**. They intervene as necessary to repair defective hand pumps.[24] In some settlements, like Nakivale, engineers have been hired by the operating partner.

### 2.1.4 Utilities

Utilities are marginally involved in providing services in refugee settlements; however, they are central actors in providing water to refugee hosting districts. To move towards a more sustainable system in refugee settlements, the Government of Uganda and the UNHCR have decided to move towards a utility model, with NWSC or UAs running water supply in these settlements. Pilot projects in Rwanwanja and Bweyale (Kiriandongo) are being implemented, to test this model and develop an appropriate approach.

The **NWSC**, an autonomous public utility owned by the Government of Uganda and positioned under the MWE, is responsible for WSS provision in 30 large and 204 small towns (The World Bank, 2018). The Corporation was established in 1972 to serve three important urban areas (Kampala, Entebbe and Jinja) and has the vision 'To be the leading customer centred water utility in the world' and the mission 'To sustainably and equitably provide cost effective quality water and sewerage services to the delight of all stakeholders while conserving the environment'. NWSC was formed in 1972 to serve three important urban areas (Kampala, Entebbe and Jinja). In the early 1990s, the Government of Uganda implemented significant policy reforms, including the commercialization and modernization of the NWSC. These reforms, coupled with significant capital investments, have led Uganda to remarkable improvements in water supply service provision, especially in urban areas where coverage increased from 43% in 1990 to 77% in 2017 (The World Bank, 2018). The company was gradually given

[24] Spare parts and allowances are provided by the WASH agency.

more authority and autonomy, and now has the mandate to operate and provide water and sewerage services in certain areas, on a commercially viable basis. NWSC provides water services in some urban districts that host refugees, such as Adjumani.

The Corporation has undergone tremendous structural, operational and financial improvements. Currently, the Corporation is mandated to provide services in more than 180 urban centres (large, medium, small and rural growth centres) across the country. The towns operated by NWSC range from large urban centres to relatively small urban centre some with rural context. NWSC recently increased the number of towns and RGCs under its jurisdiction. NWSC's own organizational capacity and ability to manage additional systems is finite and steps to track and develop its capability will be progressively required, as more towns are brought under its management. The NWSC manages refugee hosting districts.

NWSC manages a range of core and support functions on top of physical supply of water. These include commercial management, technical operations, billing & IT, finance & accounts, administration. Other support functions are managed at regional level, and include water quality, procurement, human resource, audit, and static plant maintenance. The typical management structure of an area is as follows:

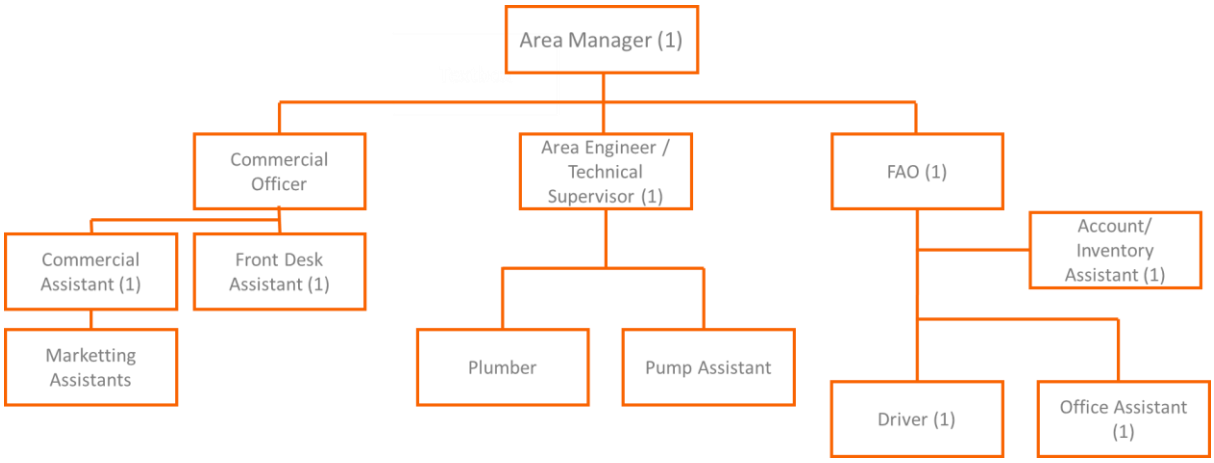



*Figure 8 Structure of an NWSC area management team*

The structure usually includes between 10-20 staff, depending on the number of accounts, geographical coverage and number of pump stations.

There are two options for NWSC to take up responsibilities for the water provision in new areas i.e. establishing a new operational area or integration into an existing operational area. Creating a new operational area for refugee settlements is deemed inadequate, as most (if not all) refugee settlements do not meet the minimum requirements for the creation of a operational area.[25] Hence, for NWSC to take over the management of water supply in refugee settlements, those would have to be integrated into existing areas.

[25] This involves creating a separate business unit under the existing delegated management contract framework i.e. the Performance Autonomy & Creativity Enhancement (PACE) Contracts. If refugee settlements are to be established as new areas,

This process would mean integrating a settlement into the delegated management contract framework of an existing area.[26] The settlement would become a branch, headed by a Branch Manager. The branch maintains a very lean staff complement of less than ten people, in charge of functions of commercial and light technical nature. Most of the non-day to day functions are maintained at parent area level (i.e. billing & IT, finance and accounts, human resource management, water quality, etc.).

The lean structure of a new branch under this model encourages multi-tasking among staff. For example, a staff member can be responsible for reading meters, distributing bills and monitoring revenue. A plumber will therefore undertake both technical and commercial assignments. The typical management structure of a branch is as illustrated in Figure 9.

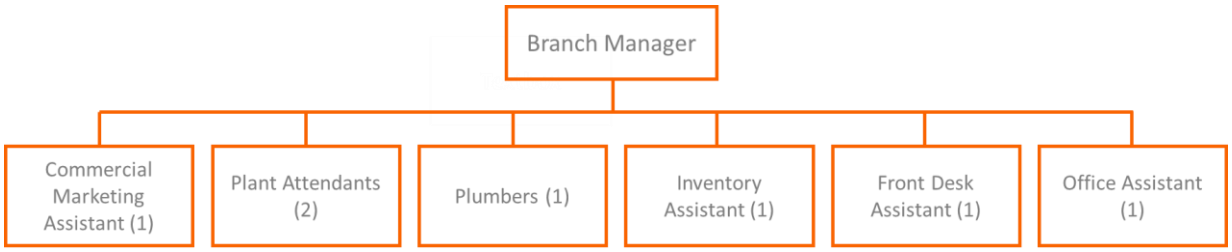



*Figure 9 Structure of a NWSC Branch (serving one operational area)*

NWSC is playing an important role in servicing poor small towns and RGCs, and its capacity can certainly be developed to serve some refugee settlements in the long run.

The Regional **Umbrella Authorities (UAs)** are six entities that operate as decentralised units of the Ministry Water and Sanitation. In 2017, the MWE updated and tailored the Umbrella management model for the 1100 piped water schemes in small towns and rural areas that are not managed by NWSC. The new UA model builds on the structures and experience of the six "Umbrellas of Water and Sanitation," previously known as Umbrella *Organisations,* that were created between 2002 and 2014 to provide high-level assistance on operation and maintenance (O&M) related activities. Under the new model the Umbrellas – now referred to as Umbrella Authorities – are appointed as Water Authorities that shifts their responsibilities from that of being supportive to one of assuming direct management responsibilities for the "gazetted" schemes. This includes contracting and supervising local scheme operators as well as handling financial management at the regional level, using computerized billing, accounting and revenue collection systems. The local communities and local government now are represented in local Water and Sanitation Committees which carry out a monitoring role.

The institutional setup of UAs is highlighted in Figure 10.

specific elements must be considered, under three categories: current and potential business volume (i.e. number of connections and revenue); complexity of the system and proximity to an existing area, and sensitivity of stakeholders to be served.

[26] Key considerations for this integration include: a) does the town have business potential both currently and in the future? b) Is the town in proximity of an existing area and is its system not complex? and c) Are serves stakeholders sensitive?

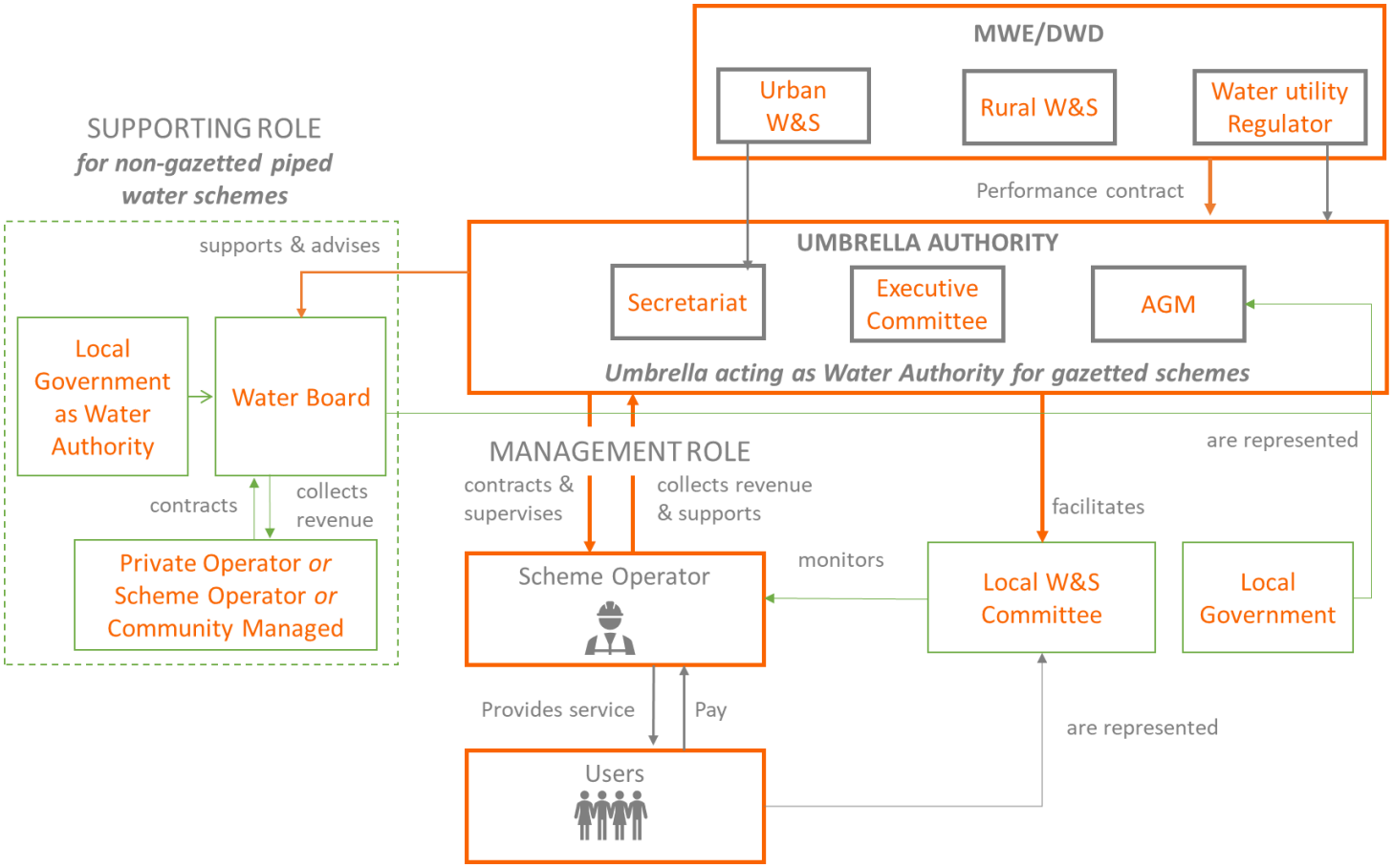



*Figure 10 Institutional setup of UAs (AGM – Annual General Meeting; W&S – Water and Sanitation)*

Since the introduction of this model, there has been a slow but steady increase in service coverage, as well as a general improvement in the operational efficiency of small and rural piped water schemes. However, the UAs have challenges in terms of capacity and these constrain their ability to effectively and efficiently manage the technical and administrative issues that arise from the individual schemes. One of the main challenges faced by UAs, is taking over schemes that are commercially viable that can cross-subsidize smaller rural schemes. For UAs to be able to manage refugee schemes there will need to be upscaled support in terms of capacity building (utility management, water treatment, scheme operator training); establishing systems for business planning accounting and asset management; as well as equipment (cars, motorcycles, mobile lab and IT equipment surveying and borehole flushing). Investment needs for UAs include start-up investments in new towns; special allocation needed for the rehabilitation of non-functional gazetted schemes; scheme extensions, and capacity increases.

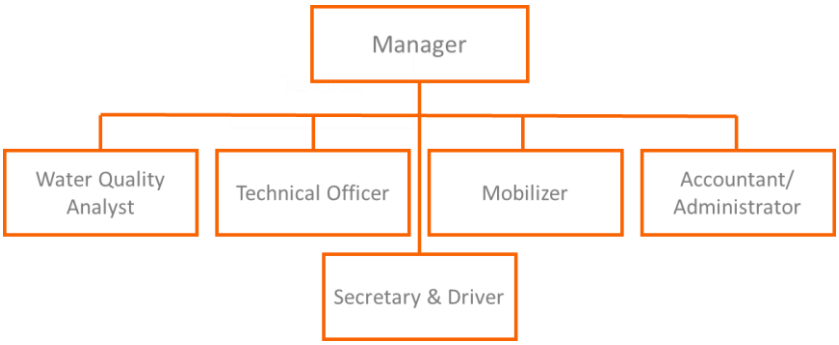



*Figure 11 Structure of UAs*

In the long run, it is argued that the management of the water supply system in refugee settlements will probably be more sustainable under NWSC and UAs than under UNHCR partners, whose long-term funding is not guaranteed. NWSC and the UAs already manage systems within refugee-hosting areas, and it is hoped that they can realize economies of scale, relying on management systems in place for the areas.

The “Umbrella Model” is becoming the standards approach of MWE for the management of small piped water systems. 220 schemes are now successfully operated by UAs nationally (from 58 in 2017) The Northern Umbrella for Water and Sanitation (NU-WS) is now operating 14 water supply systems, 76 additional systems are currently prepared for operation through NU-WS.

The MWE provide the water authorities with support through its **Water and Sanitation Sector Development Facilities (WSDFs)**, which provide financing and guidance for the design and implementation of WSS systems through six regional UAs (The World Bank, 2018).

In small towns and rural areas that are not served by the NWSC nor UAs, **local authorities (town councils)**, with the support of the MWE, are responsible for WSS service delivery. The town councils act as water service providers (water authorities) and can elect to provide services directly, utilize community-based organizations, or employ private companies (The World Bank, 2018). There are only very few cases of such management by the local government.

## 2.2 Management models for water supply in refugee settlements

Currently, the management of water supply inside and outside refugee settlements is relatively different; both systems are reviewed in the sections below. Due to the approach of our more detailed assessment, the focus is on the six settlements investigated and the hosting districts of Arua, Yumbe, Adjumani and Isingiro. However, as there is a growing appetite to adopt a utility-based management approach in settlements, other refugee settlements will be discussed as well.

### 2.2.1 In refugee settlements: partner-based system and utility-based pilots

Water supply is a task currently managed by operating and implementing partners, at times with some contributions from the community. However, a utility-based approach has been piloted in some settlements.

#### Management by operating and implementing partners

Water management in refugee settlements currently differs from water management in the rest of the country. While water delivery in the rest of the country is mainly managed by seven entities, the NSWC and six the UAs, water supply in refugee settlements is strategically and operationally managed by the UNHCR and provided by a high number of UNHCR's **operating partners (OPs)** and **implementing partners (IPs)**. OPs and IPs are not-for-profit NGOs, either being internationally or nationally based, acting as WASH agencies. While operating and implementing partners serve the same function, operating partners have their own sources of funding, and implementing partners are funded (solely or partly) by the UNHCR. Operating partners usually intervene in a refugee settlement at the onset of a crisis, but tend not to play longer-term roles (UNHCR Arua, Key Informant Interview). Most of the operation and maintenance of the water facilities in settlements is either undertaken and/or financed by implementing and/or operational partners implementing WASH activities for the benefit of refugees and host communities in the settlements (Nabide, 2018).

In most refugee settlements, there are several WASH agencies and water service providers (implementing or operating partners) functioning in different zones. Because of the large size of the settlements and heavy water provision costs, the refugee settlements are divided into zones and each IP and OP is assigned to a designated zone or area. Within each zone, each agency has the autonomy to independently design the water facilities;[27] however the UNHCR provides guidelines for more efficient systems, and the design needs to be approved by local and national governmental authorities. Governmental guidelines should also be respected, but the MWE acknowledge that the enforcement capacity is low (MWE Key Informant Interview). The numerous WASH agencies in each settlement are coordinated by the main implementation partner (Brown & van den Broek, 2018). The UNHCR undertakes evaluations of WASH agencies every two years, to assess the quality of the services provided (retention evaluation).

[27] The UNHCR recognizes that, in periods of emergency, it accepts the support of most entities offering their support and does not have the capacity to "be difficult" about the systems that will be implemented by partners, especially partners coming in with their own funds (KII, UNHCR, Arua).

In some settlements, there is a single WASH partner managing water services in the entire settlement, which is preferable to minimise costs. This is the case with Nsamizi in the Oruchinga settlement (UNHCR S-). In other settlements, multi-sectoral (multi-skilled) partners operate in a specific geographical zone.

### Community-based elements included in the partner model

In many settlements, the partner model has been combined with some elements of community-based management, with different levels of involvement, and different level of success. A good example is that of the establishment of a Water Board and a user fee in the Oruchinga settlement. In this area, the UNHCR has reported that revenue collected by the community has funded up to 30% of the O&M costs (UNHCR S-W Key Informant Interview).

### Pilot projects for a utility-based approach

In some refugee settlements, there have also been discussions around a transition towards a utility-based approach. One of the pilot projects where this approach is being piloted is the **Rwamwanja settlement**, in the South West of the country. This is a first of its kind in Uganda and is aligned with the UNHCR's strategy to integrate refugees into national plans.

The Lutheran World Federation (LWF), which was managing O&M in this settlement with the financial support of the UNHCR, is now gradually handing over its responsibilities to NWSC. This collaboration came about as local authorities (Town Councils) in the region have requested for NWSC to manage water systems in four sub-counties,[28] under which the Rwanwanja settlements fall, thereby triggering a gazetting process. The UNHCR, which has envisaged piloting a utility-based approach in one settlement (Nakivale being originally chosen), saw this gazetting process as an opportunity and thus the choice of Rwanwanja as pilot settlement was circumstantial (Juliet Ojeo Mwebesa, UNHCR KII).

At the time of writing of this report, the MoU was being negotiated between the UNHCR and NWSC, involving OPM, LWF, and refugees. Nevertheless, NWSC's activities in the settlements have already started. NWSC is supplying 13 public standpoint (PSP) under its pro-poor tariff, which is about UGX 25 per 20-liter jerrycan. NWSC plans on servicing the majority of the refugee community through public stand pipes, but will also install domestic connection (yard, and potentially household connections) for those interested.[29] NWSC will also supply institutions, and has accepted to supply certain institutions of public interest – Uganda Primary Education (UPE) schools and the Health Centre 3 – with its pro-poor tariff (Juliet Ojeo Mwebesa, UNHCR KII).[30] This tariff is heavily subsidized by a NWSC cross-subsidy system.[31] This system, known as the SCAP 100 Initiative aims at ensuring

[28] The town councils of these regions deemed that NWSC would be the best suited entity to manage water supply in their region; efficiencies was cited as a key reason. The performance of the Umbrella Authority in the region was questioned.
[29] According to the UNHCR, this should come with a clear communication on the responsibilities and on the cost associated with yard or household connections (Juliet Ojeo Mwebesa, UNHCR KII).
[30] These institutions will therefore pay UGX 1060 per m3 instead of UGX 3568 per m3.
[31] NWSC water tariffs include O&M OPEX and depreciation. For towns that cannot breakeven there is cross-subsidy mechanism in place.

universal and equitable access to safe water under NWSC jurisdiction by the year 2020. The funding to subsidize tariffs was provided with 58% by NWSC, and 42% by the Government of Uganda.

**Textbox 1: Piloting Water Delivery in Rwanwanja – the MoU between UNHCR and NWSC**

The MoU aims at adapting NWSC's policies and practices to the context of the Rwanwanja settlement. As the time of writing, the MoU was under negotiation, but the target for finalisation was very near (end of August 2019).

A major issue affecting the finalisation of the MoU related to the "proof of ownership" required for yard or household connections as part of NWSC's standard procedures, a way to minimise its exposure to non-payment of water bills. A risk would lie in seeing refugees repatriate to their homeland without paying their bills. Refugees having not own land titles (being instead custodian), this clause limits their ability to get individual connections.

It now seems likely that the OPM will act as guarantor or backstopping entity for refugees (complementing their role as landlord). Refugees would then become custodian of a NWSC account, just like they are custodian of the land on which their house is built. The application for a yard or house connection to NWSC should then be accompanied by a recommendation letter form OPM.

Apart from some specific issues, both NWSC and the UNHCR have reported that the collaboration has so far been easy. As highlighted by a NWSC employee, the objective of NWSC, to provide water to all Ugandan in areas under its mandate, is aligned to the goals of the UNHCR, who wish to protect refugees' dignity in ensuring, as a minimum, their access to basic services (KII, Mahmood Lutaaya, NWSC).

As highlighted by the UNHCR, both parties agreed that MoU negotiated is a first, and should be amended with new addendums through time, if needed (Juliet Ojeo Mwebesa, UNHCR KII).

After discussions with the MWE, the UNHCR has put in place a strategy for a phased introduction of community contributions towards water fees (KII, Mahmood Lutaaya, NWSC). Initially, the UNHCR and partners will support the payment of water fees, most likely through the distribution of "water vouchers", which will allow households to receive 20 litres daily, free of charge (KII, Mahmood Lutaaya, NWSC). The support from UNHCR and partners will gradually decrease (and contributions from the community gradually increase) as livelihoods improve. In the long run, it is expected that refugees will be able to cover the full costs of water services. Additional purchases will be billed at a pro-poor tariff. To ensure that this tariff is fixed, the water vendor will be paid a monthly salary (rather than take a commission over the jerrycans), subsidised by the UNHCR (KII, Mahmood Lutaaya, NWSC).

NWSC will take over the centralised piped distribution system, but not to point sources. It is expected that the community will continue to manage such sources. In the Rwanwanja settlement, there are about 60 hand pumps. It is likely that these sources will be used for productive activities requiring water.

**Textbox 2: Unanswered questions around the water voucher**

Questions regarding the financing and recipient of water vouchers are not yet resolved, but the UNHCR WASH team is currently working on it (Juliet Ojeo Mwebesa, UNHCR KII).

The UNHCR is likely to subsidise part, or all, of the water voucher; some advocate that the UNHCR should offer a 100% subsidy at first, while others suggest that all refugees (apart from the most vulnerable people) contribute to part of the financing. Under the management of LWF, most refugees contributed to a UGX 1000 user fee per month per household. Providing a 100% subsidy would constitute a step back, away from an improved system sustainability. Further, it has proven difficult to diminish the number of subsidies. However, there is a real challenge relating to the operationalisation of a cost sharing model between refugees and UNHCR.

Similarly, there are some uncertainties regarding who the vouchers/subsidy recipients will be. While some agree that all refugees should receive it, other believe that only vulnerable individuals – a group profiled by the protection team – should benefits from it.

The mechanics of a voucher system are also unclear. While the UNHCR had first envisaged to install a meter at the PSP, with "households accounts" credited for 20 litters a day, this system is now questioned, as results from piloting this metered pre-load credit system in other regions have been unsatisfactory. Instead of a metered system, the voucher system might be applied to ordinary PSPs using a token system. However, this is expected to be highly complex, and fraud and security risks relating to cash handling are considerable.

Another important question relating to the water voucher is how to manage the potential discontent of host communities living in or in the close vicinity of the settlement. While they had access to free water at the PSP under LWF's management, they are likely to disapprove of the voucher system if they do not benefit from it.

The UNHCR and other relevant stakeholders will have to solve these voucher-related challenges in the very close future.

Elsewhere in the country, the transition towards a utility-based system has been initiated or is being discussed. The transition from the Danish Refugee Council (DRC) towards NWSC is underway in the **Bweyale refugee settlement in Kiryandongo** (often referred to as Kiryandongo settlement) (Innocent Kansiime, NWSC Kiryandongo, KII). There, a new water system (commissioned by the MWE), currently under construction, will be handed over to NWSC for operations and maintenance. The date for the complete take-over is not yet set. NWSC will connect public standpoints under the pro-poor tariff. Refugees are currently not paying a user fee, therefore, issues around affordability and willingness to pay might present challenges (Innocent Kansiime, NWSC Kiryandongo, KII). Institutions are to pay to normal institutional tariff, but discussions are underway to mimic the benefit given to certain institution in Rwawanja, i.e. to pay a pro-poor tariff. The system is hoped to address acute water scarcity problems in the settlement, which has led to tension between different ethnic groups in the refugee settlement (Apunyo, 5 December 2018).

Finally, discussion regarding a transition were held regarding the Adjumani district, where a large EU-funded project with a "water extension" component might lead to NWSC taking over water supply in some parts of Adjumani's settlements. Another project in the Isingoro district could lead the Nakivale and Oruchinga refugee

settlements to transition from Nsamizi to NWSC; in Isingoro, the French AFD and the EU are providing direct support to NWSC for a transition project. NWSC has expressed its willingness to assist in providing water anywhere in Uganda (KII, Mahmood Lutaaya, NWSC).

All in all, as highlighted by the UNHCR for the South West region, different systems are being piloted to find a more sustainable solution than the current system, which is operated by partners and almost fully supported by donors; this is a challenge, as the government, UNHCR and partners have to "build the plane as they are flying it". This requires ongoing and sound coordination and communication between the various actors. The WASH forum should be playing a key role in supporting that ongoing discourse. This will require that all actor actively engage and frankly discuss progress and process, to enable co-learning and the development of the most appropriate models.

As the utility pilots gain some maturity, the UNHCR and MWE will be able to extract key lessons learnt. Using lessons learnt to improve the transition of other settlements from a partner to a utility model will be critical.

### 2.2.2 In hosting districts: variety of models

According to Brown and van der Broek, there are seven models of water management in Uganda: Community Based Management Systems (CBMS); Village Savings and Loan Associations (VSLA) District Public-Private Partnership (PPP) Approach; Water as a Business (operated by Water for People); UAs management; NWSC management; and Trade Water Model (Brown & van den Broek, 2018).

These different systems are found in the four districts hosting the six schemes investigated in the present report. For example, in Adjumani, Arua and Yumbe, both NWSC and the Norther Umbrella are operating water supply systems. In Arua, Water Mission are also operating schemes, and in Isingiro, NSWC and the South-Western Umbrella are active.

The Government of Uganda has developed programs and policies to improve water supply and sanitations services in poor small towns and RGCs, supporting, since the early 2000s, the introduction of private operators to manage piped water systems through management contracts with town councils. To scale up this successful approach, the GoU adopted a clustering (regionalization) service delivery approach in which the NWSC assumes management responsibility. The small towns managed by the NWSC have experienced marked improvement in revenue collection, network expansion, and service quality. The GoU plans to continue transferring small towns to the NWSC as long as it is technically and financially viable for NWSC (The World Bank, 2018).

When this is deemed not to be viable, the MWE will transfer management responsibility of piped WSS systems to the regional UAs. The MWE is developing guidelines to guide and streamline the operation of UAs and to establish a specific tariff structure. In August 2017, the MWE appointed six regional UAs[32] as Umbrella Water Authorities (UWAs) in charge of 71 small towns (about 10 small towns per UWA). To date, the UWAs have

[32] Northern, Midwestern, Karamoja, Southwestern, Central, and Eastern

performed relatively well with average 75% revenue collection rate and 29% non-revenue water (NRW), and positive financial data.[33] Currently, UWAs cover their O&M costs, but are dependent on public financing for capital investments. The World Bank found that the GoU's policies will enable the UWAs to reach cost recovery in five years (The World Bank, 2018).

## 2.3 Access to water

There are 35 sub-counties hosting refugees in Uganda. While few data specific to these regions is available, data on water supply in rural Uganda provides a useful baseline. In the rural areas, about 63% of the population has access to water supply. In some of these sub-counties, including Nakivale, Oruchinga and Bidibidi, access to water is at less than 50%. Nationally, in rural areas, 70% of the Ugandan population have access to water supply (June 2018 numbers), thereby demonstrating that refugee-hosting sub-counties are below national standards (MWE, 2018, as captured in the WESRRP). Nine sub-counties hosting refugees are not served by any water system[34] but plans should soon remediate this situation; none of these sub-counties were investigated as part of this case study review.

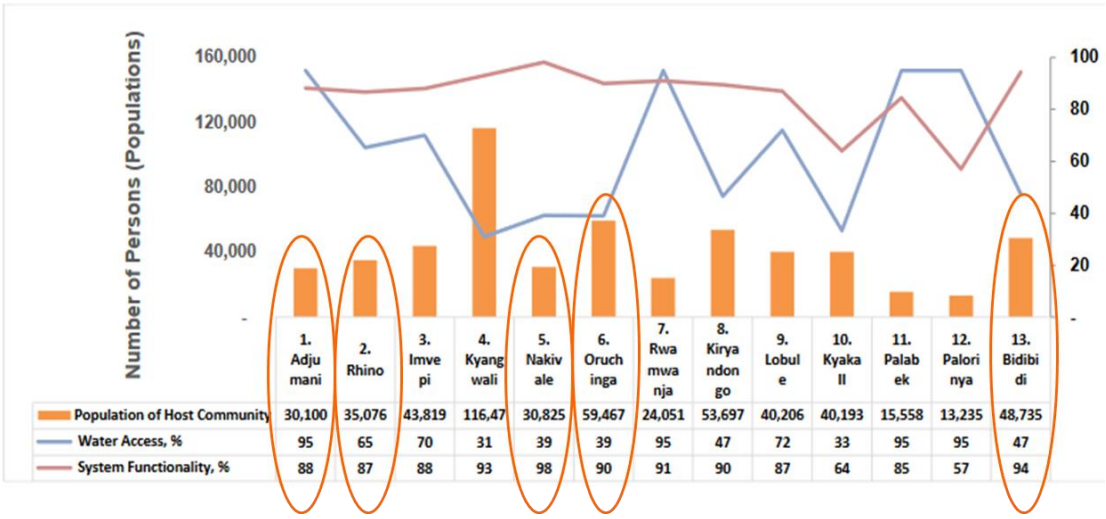



*Figure 12 Population served in refugee hosting communities (Source MWE SRP, in WESRRP) - host community's population, water access & water sources functionality*

In terms of water quality and based on a sample study, MWE assessed that 64% of water collected from improved water sources in the rural areas complied with national standards, 60% in small town, and 87% in large town managed by NWSC.

[33] Financial data indicate that the Northern Umbrella and the Midwestern Umbrella service 2,809 and 2,387 active connections, respectively, and collected UGX 27.5 million and UGX 33.6 million in October 2017, respectively. Their O&M costs for October 2017 were UGX 16.3 million and UGX 27.1 million, respectively.

[34] Ngarama, Rushasha and Kashumba in the Insingiro district, Kikube in the Kyangwali district, Katalyeba in the Kamwenge district, Mutunda in the Kiryandongo district, and finally Mpara, Kyegegwa Rural and Ruyonza in the Kyegegwa district.

**2017-2018 Data for Water Supply in Uganda**

70% of the rural population and 77% of the uban population use improved water

38% of towns have pro-poor facilities (people pay less or equal to house connection tariff in the service area

85% of piped water service availability in urban settings

89% of water points have an actively functioning Water and Sanitation Committees (management)

64% of water sample taken in rural settings compy with national standards of drinking water quality (point water sources and piped schemes); that rate is at 89% for small towns, and 99.3% for NWSC operated schemes.

*Figure 13 Data for water supply in Uganda (Data source MWE SRP, in WESRRP)*

## 2.4 Water supply systems

Throughout rural Uganda, the main technology used for water supply improvements are deep boreholes (44%), shallow wells (24%) and protected springs (21%). Other systems include tap stands/kiosks of piped schemes and rainwater harvesting tanks (11%) (SPR 2018). Functionality for rural water supply sits at 85% and water points with functional water and sanitation committees was estimated at 89% (June 2018).

In refugee settlements, there are three main supply systems: point water sources for low yielding boreholes, and piped water sources, as discussed below. To that, another "source" or vehicle for water supply can be added: water trucking.

### Point water sources for low yielding boreholes

This supply system is constructed at the location of the water resources. Users come to the source to fetch water and transport it to the point of use. In most cases, point water sources are equipped with simple technology such as hand pumps. Normally, point water sources are installed in rural, low density communities or where the groundwater yield is low (about one litre per second) (Nabide, 2018).

### Piped water sources

This supply system consists of storage tanks and pipes to transport the water from the location of water resource extraction to the point of water collection. This system is often associated with relatively complex technology. To abstract water from the resource, piped systems are equipped with motorized pumps and hybrid (solar/diesel generator) pumping systems. UNHCR encourages the construction of hybrid water systems to guarantee on-going water supply during cloudy days (Nabide, 2018).

Although the technical designs of each system are approved by governmental authorities, the piped water systems vary in terms of design standards, technologies and materials used;[35] this difference in system is predominantly due to the difference in funding available to each organisation, and the time pressure to design a piped system (Nabide, 2018).

Densely populated refugee settlements often have piped water sources; there, the scale of water supply is close to that of urban settings. In dispersed settlements, large distribution networks are also required. These large piped water supply systems can have reduced operational costs, but distribution can be more complex (Nabide, 2018).

As of March 2019, 148 motorized water production wells and/or piped water supply system were operational or completed (MWE, 2019).

### Water trucking

In the initial stages of an emergency, refugee settlements are often provided with high quality (chlorinated) water brought by trucks. In some settlements, this practice can remain for a long time, despite the fact that it is inefficient, difficult to manage, labour intensive, expensive and unsustainable. This is the case in Bidibidi, where currently 12% (35% when the settlement was established) of total volume of water is provided by trucks.

The UNHCR, donors, IPs and Ops are all calling for prompt phasing out of water trucking and construction of more permanent systems. Based on data from July 2017, every day, about USD $100,000 is spent on water trucking in Uganda (Brown & van den Broek, 2018). Many argue that this money could be used more effectively if channelled into permanent water supply systems. Irregularities and high costs in water trucking were also

[35] Whereas some organisations construct small scale piped systems at a minimum standard, others construct large scale systems with high-end technologies.

raised in the media. UNHCR encourages WASH partners to increase the number of piped water facilities which are viewed as cheaper, cost-efficient and more sustainable than water trucking.

Among the six schemes investigated, households interviewed explained that public standpipes (at 59%) and borehole water (at 39.7%) are the two main sources of water for household use across the settlements. In Nyumanzi, the interviewees reported depending on borehole as their main source of water at 91.8%. It can be mentioned that no household has access to a tap in the household, but some reported having access to a yard tap.

*Table 2 Main source of water for households across 6 settlements*

| Settlement | Public standpipe | Borehole | Yard Tap | Tap in Household |
|---|---|---|---|---|
| **Ofua** | 72.3% | 19.1% | 23.4% | 0.0% |
| **Swinga** | 67.3% | 67.3% | 6.1% | 0.0% |
| **Zone 4** | 75.5% | 16.3% | 18.4% | 0.0% |
| **Nyumanzi** | 16.3% | 91.8% | 2.0% | 0.0% |
| **Oruchinga** | 57.1% | 22.4% | 34.7% | 0.0% |
| **Nakivale** | 65.4% | 21.2% | 36.5% | 0.0% |
| **Average (%)** | **59%** | **39.7** | **20.3%** | **0%** |

## 2.5 WASH services

Throughout rural Uganda, only 79% of the population access to basic sanitation (district reports FY 2017/18, combined in the 2018 SPR). Hand washing facilities are present in about 40% of schools in the country (FY 2017/18). Open defecation about the Ugandan population is of 8%, which is much lower than in refugee settlements. Recognizing the issues with sanitation, and in an effort to improve standards, most districts have implemented a Community-led Total Sanitation (CLTS) programme and engaged in Home Improvement Campaigns (HIC).

**2017-2018 Data for Sanitation in Uganda**

36% of the urban population uses an improved sanitation facility that is not shared with other households; No data is available for the rural population

8% of the rural population practices open defecation; that number stands at 12.6% in the urban population

36.5% population with hand washing facilities with soap and water at home: rural: 36.5%, urban, 39.6%.

Schools: percentage of pupils enrolled in schools with basic hand washing facilities: 40%.

*Figure 14 Sanitation data in rural Uganda (Data source MWE SRP, in WESRRP)*

Turning to refugee settlements, in all six visited sites, there were no waterborne sanitation systems. While some pit latrines were reported as functional, only few households or yards were equipped. Humanitarian actors provide material to construct the latrines, however, in many cases, the latrines are constructed on inappropriate soil, and collapse with heavy rain. Open defecation is therefore widely practised. This can have important implication in terms of water supply, as poorly managed sanitation can lead to groundwater pollution, especially where groundwater is shallow. This can pose contamination challenges. Further, in most cases, the design or construction of the latrines does not allow for them to be emptied. Rather, latrines that are full are closed, which poses a risk in terms of groundwater contamination. There is no faecal treatment in most settlements.

Public institutions such as schools are also equipped with pit latrines, some of which can be emptied (such as in Nakivale). The level of cleanliness of these public facilities is reported in some settlements to be poor.

In most settlements, the WASH agency organises the services of a hygiene promoter, who promotes hygiene advice, such as how to clean a jerrycan. Women are given soap by the UNHCR or a development partner, but in quantities that are said by many to be insufficient. In some settlements, material to construct a basic system to wash hands after using the pit latrine (often referred to as 'tippy taps') is provided. However, only a small minority of households seem to use the tippy taps.

All in all, the sanitation and hygiene of the household is dependent on a common water point, and on women's ability to fetch water.

## 2.6 Financial flows

The financing of water supply services is becoming an issue of contention in Uganda; because refugee's consumption (and that of Ugandans living nearby settlements) is mostly free, and hence there are issues of equity being raised. The MWE is taking this seriously and is, therefore, now working with the UNHCR to set up fair and affordable user fees is refugee settlements. Financing streams in and outside refugee settlements are

discussed in the sections below. Outside settlements, the focus is being placed upon NWSC and UAs' user fees, as the MWE is promoting the development of a utility-based approach in refugee settlements.

### 2.6.1 In refugee settlements

The refugee response in Uganda is met by international humanitarian aid, government contributions, in-kind contribution by host communities, and development aid. Small financial contributions by refugees and remittances also contribute to refugee's costs.

**Humanitarian aid** is an important support factor for refugees. According to the Humanitarian Policy Group (HPG), international humanitarian aid "is the only form of assistance regularly counted and visible in publicly available sources" when it comes to refugee response in Uganda. In 2016, international humanitarian aid totalling $156 million was captured in UN OCHA Financial Tracking Service (FTS) data; this, according to HPG, is the only publicly available figure on resources directly targeting refugees (Poole, 2019). The Institute for Security Studies estimated that refugees in Uganda depend on US$1.86 billion of donor funding (2019 numbers).

Direct resource transfers from other actors including remittances, are almost impossible to track and are therefore largely unknown (Poole, 2019).

**Government contributions** to refugees' wellbeing include the provision of legal refugee status, and the right to move freely, to work, and to access services. These "off budget" items are difficult to quantify in economic terms. Even when it comes to budgeted items, governmental expenditure for refugees is difficult to financially quantify. In 2016, total government expenditure reached $11.1 billion, $9 million being allocated to key services,[36] but it is difficult to quantify the amount that has benefitted refugees or host populations (Poole, 2019).

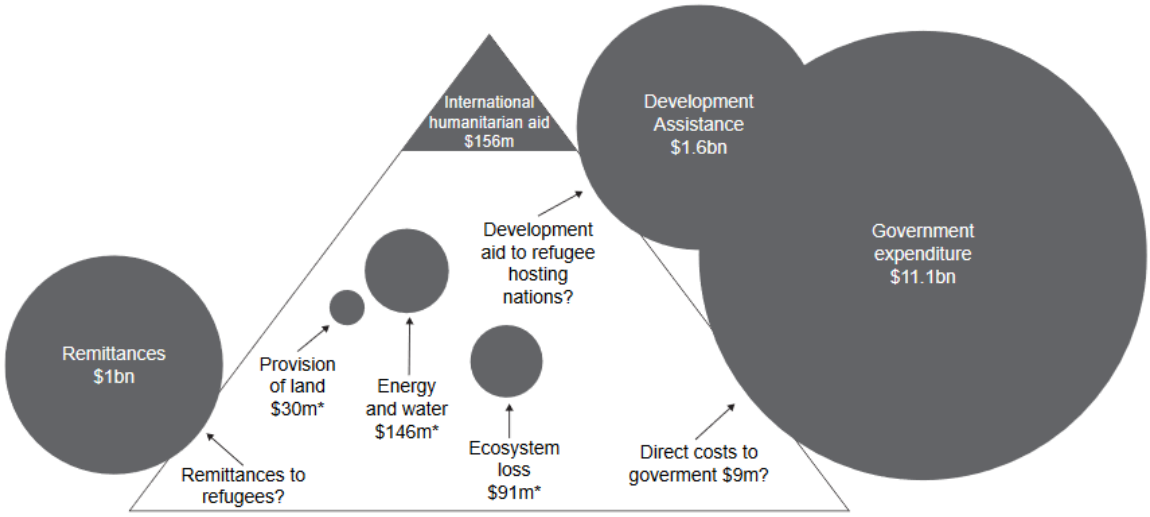
Further, **In-kind resources by host communities** are also important and comprise giving access to land for settlement and cultivation, as well as access to natural resources, including firewood (Poole, 2019).

Part of the broader **development aid** received by Uganda from official donors reporting to the total ODA, minus humanitarian aid ($1.6 billion in 2016)[37] also benefits refugees and the host population, either directly or indirectly (Poole, 2019).

**Financial contributions by refugees** also provides support in addressing their costs, even if only marginally. When it comes to water supply, water fees have been implemented in many settlements to improve the sustainability of the water systems. This contribution can be supported by refugee's savings, work and revenue streams in the settlements, or by remittances (which play an important role in supporting refugees). Available statistics only concern formal remittance[38] received by residents of Uganda ($1 billion). Most refugees have

[36] A United Nations Development Programme (UNDP) study in 2017 estimated the costs to the national budget of providing key services – security, education and health – at $9 million.
[37] Total ODA, minus humanitarian aid
[38] Recorded in Central Bank and government statistics

limited access to formal banking services in Uganda, meaning the remittances they received are therefore likely not to be fully captured in official statistics.




**Note that these values are estimates and do not represent actual resource transfers.*
*Source: Based on data from UN OCHA FTS, OECD DAC, World Bank remittance data, IMF World Economic Outlook and UNDP.*

*Figure 15 Known costs of refugee response in Uganda (2016)*

*Source: (Poole, 2019)*

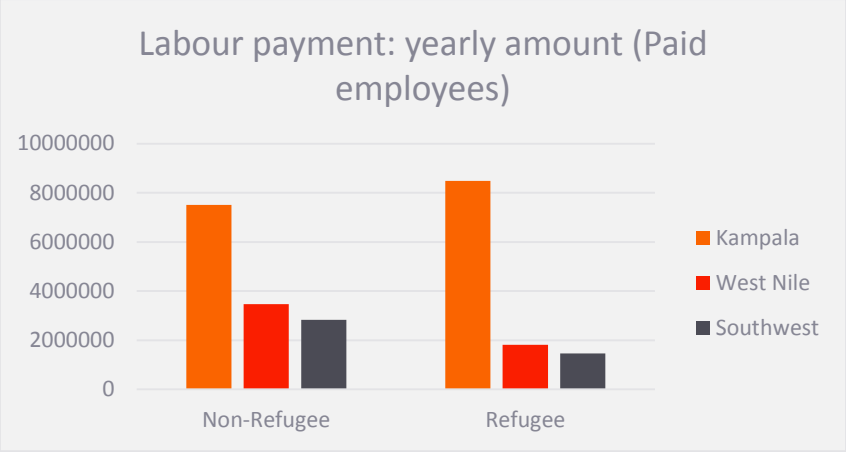
### 2.6.2 In hosting districts

The yearly overall per capita cost for rural water supplies was UGX 246,663 (68 USD) (FY 2017/18). During the 2017/2018 financial year, a total of UGX 131.2 billion was invested in improving water supply (rehabilitation and construction of new boreholes, construction of mini schemes, protection of springs, installation of rainwater harvesting systems, telemetry updates); this is estimated to benefit some 532,000 people (district reports FY 2017/18, combined in the 2018 SPR).

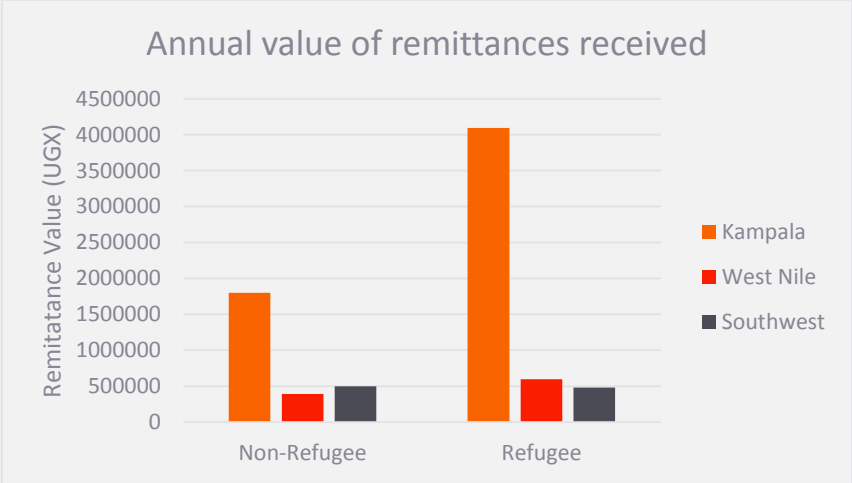
The O&M cost of water supply systems in Uganda are covered by user fees, and in some places are subsidised by development NGOs or development aid. The following investigated financing streams to the NWSC and UAs, as these are the most relevant models to this report, as they are likely to be implemented in refugee settlements in the close future.

**Textbox 3: Income Dynamics in hosting districts**

This study extracted no household survey data from host district (non-refugee) households. However, previous work conducted by the World Bank (World Bank, 2019) compared refugee and non-refugee household income dynamics in the Kampala, West Nile, and Southwest hosting regions. This study found that non refugee household benefit from higher annual income through paid employment, but that refugee households receive higher remittances contributing to annual household income. Overall, the average household income in refugee and non-refugee households is similar.




*Source: World Bank. 2019. Informing the Refugee Policy Response in Uganda. Results from the Uganda Refugee and Host Communities 2018 Household Survey. © World Bank.*




*Source: World Bank. 2019. Informing the Refugee Policy Response in Uganda. Results from the Uganda Refugee and Host Communities 2018 Household Survey. © World Bank.*

This study also found that, overall, refugee and non-refugee households live very similar economic lives. Where refugees may benefit from food aid and other in kind transfers and assistance, these become inputs to the trade network with non-refugees, providing a source for consumption that would have otherwise been limited. These dynamics are due to the hosting of refugees in rural and sparsely populated regions of Uganda. In locations as remote as these, there are limited economic networks that would benefit non-refugees over refugees.

### User fees by NWSC

The NWSC applies a universal and volumetric charge that distinguishes between domestic, institutional, commercial and industrial customers. Critically for the refugee context, NWSC offers a pro-poor rate – Public Standpipe (UGX 25 per jerrican or UGX 1060 per $m^3$) which could be applied in refugee settlements. In the short

to medium term it may be necessary for the system operators to aggregate this rate into a per household charge based on what each system is able to deliver to the household.

*Table 3 Existing NWSC fee structure*

| Category | Charges/$m^3$ (UGX) | Tariff per 20 Litre Jerrycan (UGX, VAT Inclusive) |
|---|---|---|
| Public standpipes | 1,060 | 25 |
| Domestic | 3,516 | 70.3 |
| Institutional/Government | 3,55 | 71.2 |
| **Commercial;**<br>First 500m3 per month<br>501 – 1500m3 per month<br>Over 1500m3 per month | <br>4,220<br>4,220<br>3,373 | <br>84.4<br>84.4<br>67.5 |
| **Industrial**<br>Under 1,000m3 per month<br>Above 1,000m3 per month | <br>4,220<br>2,500 | <br>84.4<br>50.0 |
| **Sewerage Tariff** | | |
| **For Domestic Category** | 75% of water usage | N/A |
| **For Other Categories** | 100% of water Charge | N/A |

*(source: https://www.nwsc.co.ug/index.php/home-mobile/item/172-tariff-guide)*

NWSC has a presence in the towns of Arua, Adjumani, and Yumbe (the district capitals) and the tariff structure is applied uniformly across these schemes. To our knowledge, NWSC does not have a presence in Isingiro District.

### Other financing streams to NWSC

Apart from the revenue received from paying customers, the NWSC is supported by donor assistance, mostly in the form of grants, and especially for infrastructure projects. The revenue raised by tariffs does enable financial sustainability in the NWSC, the ratio between total revenue collection and O&M costs is 158% as of the 2017/2018 financial year. (MWE, 2018, as captured in the WESRRP).

Subsidies are received in the form of transfers from government for capital project and co-financing (administered by MWE). Loans received from development partners are dispersed to the Government of Uganda and allocated to NWSC. Subsidies are only provided for investment/capital requirements. Operational subsidies are not provided but the NWSC uses financially secure schemes to cross-subsidize less financially secure schemes (i.e. refugee schemes).

### User fees by UAs

While there are no clear criteria guiding the allocation of piped water schemes between NWSC and the UAs, smaller piped schemes (including those in rural areas) are increasingly being taken over by UA management. UA's also use volumetric charging to establish fee structures, at a slightly lower rate than NWSC as they operate in rural areas.

The following table details the UAs responsible for the districts and refugee settlements of focus in this study.

*Table 4 UAs Active in Districts of Focus*

| Umbrella Authority | Host District | Refugee Settlement |
|---|---|---|
| **Northern** | Yumbe | Swinga and Zone 4 (Bidibidi) |
| | Arua (Arua town managed by NWSC) | Ofua 6 (Rhino) |
| | Adjumani (Adjumani town managed by NWSC) | Nyumanzi |
| **South-Western** | Isingiro | Oruchinga |
| | | Nakivale |

The fees charged by the Northern UA range from 1500 to 3000 UGX per $m^3$ and the South-Western UA fees range from 1000 to 4000 per $m^3$. Fees in UA-managed systems are set specific to the scheme, considering operational cost recovery and affordability in the recipient communities.

### Other financing streams to UAs

UAs are funded from the following sources:

1. Government of Uganda (GOU) through Ministry of Water and Environment.
2. Joint Partnership fund (JPF) through Ministry of Water and Environment.
3. Local collections from water user fees.

In April 2018 the Umbrellas have received seed funding from the **"Revolving Fund"** an arrangement to finance small to medium investments such as major repairs and replacement of equipment; scheme extensions and capacity increase; subsidised connections; metering of unmetered schemes and water source protection (MWE, 2018)

Each UA has a ring-fenced account for the Revolving Fund (RF). Loans from the RF can only be used for the specified purpose and have to be paid back from the collected revenue. This allows to make upfront investments and use the increased revenue (resulting from the investment) for back payments. The RF can thus be considered as the Umbrellas' "credit card" for minor investments. However, complete overhauls or rehabilitations of old schemes will still need to be financed from other sources (MWE, 2018).

### Textbox 4: Water charges by NWSC and UAs

Outside of refugee settlements, water supply in Uganda is managed in one of two structures: the NWSC covers settlements that are in or neighbour urban areas, and UAs cover settlements that do not fall under the NWSC or which are in rural areas that are too distant from NWSC's existing schemes.

The NWSC apply a universal and volumetric charge that distinguishes between domestic, institutional, commercial and industrial customers. Critically for the refugee context, NWSC offers a pro-poor rate (UGX 25 per jerrican or UGX 1060 per m3) which could be a useful benchmark for application in refugee settlements (this is above the estimated O&M cost of water supply per m3 in Oruchinga, but below the cost in Nyumanzi and

Nakivale). Based on geographic proximity, the NWSC may be the most obvious management option for Nyumanzi, Nakivale and Oruchinga (and, in the longer term, Ofua 6).

UAs also apply volumetric charges, but these are established on a case-by-case basis. Generally, they are set at a slightly lower rate than NWSC as they operate in rural areas. UAs may be the more obvious long-term management option for Swinga and Zone 4.

## 2.7 Recent developments: international and governmental focus on self-reliance, resilience and on developmental approaches in the refugee support field

Recently, international and Ugandan actors in the refugee field have been taking steps towards building the resilience and self-reliance of refugee communities in their host state. Approaches to developing this capacity are multiple and require implementation in a phased and progressive manner.

### Policies towards self-reliance and resilience

Recently, the international focus on refugee policy has changed its focus away from the provision of short-term humanitarian aid towards developing longer-term assistance and providing mechanisms that support the integration of refugees into the local economy and society (Development Pathways, 2018). Uganda's progressive refugee policy is aligned with this philosophy: as part of the 1999 **Self-Reliance Strategy (SRS)**, the Government has expressed a willingness to develop a long-term, development-oriented support strategy to refugees within Uganda. The SRS gave refugees the right to receive, upon arrival in Uganda, the tools to develop sustainable and self-reliant livelihoods (that included a plot of land, seeds and food rations for two to four seasons).

The **2004 Development Assistance for Refugee-Hosting Areas (DAR)** programme replaced the SRS but maintained a similar approach (Development Pathways, 2018). The 2006 Refugee Act (further strengthened by the 2010 Refugee Regulation) improved refugee's rights, giving them freedom of movement in the country, the right to work and own a business, and equal access to (the limited)[39] social services provided by local authorities, such as primary education and health care (Center for Global Development, 2017). For equity[40] and to facilitate integration between refugees and host communities, the Act gave host communities access to services funded by humanitarian aid. Agriculture was seen as the major source of livelihoods and economic independence for refugees, and refugee households were therefore given land (Omata & Kaplan, 2013).

Recently, to support Uganda's efforts to respond and manage the ongoing influx, the World Bank and the UN system in Uganda joined forces to develop the **Refugee and Host Population Empowerment (ReHoPE) Strategic**

[39] Social protection is a core public service but is almost non-existent in Uganda apart from a small number of districts.
[40] In the same vein, it can be noted that a directive by the Government of Uganda commits humanitarian actors to ensure that 30% of assistance services, where appropriate and feasible, benefit host communities (except for food assistance).

**Framework**. ReHope is expected to enhance the Government's **Settlement Transformative Agenda (STA)**,[41] and strengthen the resilience and self-reliance of host communities and refugees (Malango, n.d.). Importantly, the programme aims at moving away from a short-term, single agency, project-based response to multi-year and multi-sectoral approaches. It aims at improving coordination and integration of humanitarian aid with long-term development programmes. It also advocates for engaging and empowering refugees and host communities and strengthening governance services.

With ReHoPE as a key component, the government of Uganda also committed to pilot the 2016 **Comprehensive Refugee Response Framework (CRRF)**, a country-level approach to supporting commitments made under the New York Declaration for Migrants and Refugees.[42] The CRRF comprises a pillar[43] on reliance and self-reliance, which is intended to bridge humanitarian and longer term development programming, and includes livelihood initiatives, enhanced service delivery and activities to promote peaceful coexistence (Poole, 2019).

As part – or in the context – of the CCRF, the government is developing a **Water and Environment Sector Response Plan**. As presented in introduction, the Sector Response Plan respond to challenges around water supply in refugee settlements in a coordinated and integrated manner, and to manage limited resources efficiently.

**Textbox 5: The ReHope Programme** (UNHCR, June 2017)

The Refugee and Host Population Empowerment (ReHoPE) Strategic Framework is a transformative strategy and approach to bring together a wide range of stakeholders in a harmonised and cohesive manner to ensure more effective programming. It is a response to specific challenges faced in delivering protection and achieving social and economic development for both refugee and host communities. ReHoPE's approach to delivering protection and social and economic development is envisaged to equally serve all refugees while they are in Uganda as well as when they eventually return to their countries of origin. Through nine core principles, ReHoPE seeks to address the humanitarian and development needs of refugee-hosting districts in Uganda, with key roles for all stakeholders based on their comparative advantage and on the principles of partnership.

### Recent consensus around the need for refugees to financially contribute to water services

For years, refugees have not been financially contributing to the construction and O&M of the water systems providing water to their settlements. Protection actors responsible for the management of refugees in Uganda – both within the UNHCR and the Office of the Prime Minister – deemed refugees too vulnerable to contribute to basic needs such as water. Refugees flee persecution or conflict from their home country, and typically arrive

[41] Through the STA, ReHoPE supports the Government of Uganda's integration of refugees into the National Development Plan II (NDPII, 2015/16–2019/20) thereby making refugees part and parcel of the development agenda of Uganda.
[42] adopted by the UN General Assembly in October 2016
[43] The other pillars include: admission and rights, emergency response and ongoing needs, resilience and self-reliance, expanded solutions, voluntary repatriation.

in the recipient country with limited resources or supporting networks to help them rebuild their livelihoods in the host country.

However, after realising that some refugees were integrating into host communities, making a living, and settling for long periods of time (if not permanently) in Uganda, small user fees were introduced in some settlements. In accordance with the ReHoPE approach of self-reliance and equal rights and opportunities between refugees and locals, there is a growing consensus that refugees will need to start contributing to the maintenance of water sources. According to the UNHCR, there is a growing understanding and acceptance amongst refugees in Uganda that they will have to pay for water. The potential role for the private sector in providing water services in refugee hosting areas is also increasingly being recognized (Brown & van den Broek, 2018).

This increasing focus on sustainability and self-reliance has led the UNHCR and partners to pilot new systems in settlements to help sustain O&M costs for water supply systems, as discussed under the management model section (Rwamwanja and Bweyale/Kiryandongo settlements). Earlier this year, the MWE and UNHCR also formally agreed on a move towards utility-based water management in refugee settlements.

### Discussion around the introduction of Cash Based Incentives (CBI)

In an effort to transition from an approach of humanitarian relief to one of developmental support in protracted situations, the UNHCR has introduced Cash Based Incentives (CBI) within their WASH Programmes in refugee settings in Lebanon and Turkey (Brown & van den Broek, 2018). The UNHCR has been providing refugees with a Minimum Expenditure Basket (MEB) (with a cash transfer as the preferred option); the Basket integrates the cost of water, and refugees are, therefore, expected to budget and pay for water. Brown and van den Broek (2018) investigated the appetite for CBIs at national and local level in Uganda. They found that national actors were supportive of the idea, in particular for the richer and more established segments of refugee populations. However, doubts were cast on the success that CBIs would have in settlements like Adjumani, where it is said many people have become so vulnerable that they have lost ability to be self-sustaining. CBIs were proposed as a transitioning factor, to be reduced with time, until the financial capacity of refugees is solid (Brown & van den Broek, 2018).

# 3 Key Case Study Findings

*This report is preceded by a Field Study Report, capturing the key findings of six case studies. This chapter summarises key field findings. When relevant, best practices and lessons learnt are highlighted in a textbox; this is important to highlight, as successful approaches or projects could be replicated in other settlements.*

In the Field Study report, each case study is divided in 11 sections: general info; socio-economic data on the refugee population; water supply systems; water quality and quantity; operating partners and institutional landscape; community involvement, user fees and willingness to pay; O&M requirements and costs; sanitation and hygiene; host community; water supply challenge; best practices. These case studies helped us inform the present report.

As indicated in the Overview of the Methodology, the case studies were selected for their variety of features, some of which are captured in Table 5.

*Table 5 Key features of the 6 case studies*

| Zone (settlement) | Est. population | Water source | Service provider | Daily Production (m3/day) | Service quality[44] | User fees (UGX) |
|---|---|---|---|---|---|---|
| Ofua (Rhino Camp) | 26,145 | Borehole | DRC | 400 | 2.50 | None |
| Swinga (Bidibidi) | 49,024 | Borehole | Water Mission | 416 | 4.00 | 0-1000* |
| Zone 4 (Bidibidi) | 31,297 (Oct 2018) | Borehole | NRC | 299 | 4.00 | None |
| Nyumanzi | 36,000 | Borehole | LWF | 109 | 2.50 | 1000 |
| Oruchinga | 7,350 (Apr 2019) | Borehole | Nsamizi | 85 | 3.00 | 1000 |
| Nakivale Base Camp | 12,982 | Surface | Nsamizi | 144 | 3.00 | 1000 |

*20% households in Swinga settlement reported making water payments (UGX 1000), despite no fee being formally established.

[44] The service quality assessment was made by the engineering team on the basis of observations, but also on findings from the KIIs and CFGDs. The assessment focuses on two key infrastructure properties: 1) the borehole yield and 2) the tank storage capacity. It is based on a five-point Linkert scale qualifying the condition of the system, according to the following: 1-Poor, 2-Fair, 3-Good, 4-Very good and 5-Excellent.

## 3.1 Socio-economic analysis

Oruchinga and Nakivale (Base Camp) are located to the South and host refugees primarily from DRC, Burundi and Rwanda. Nyumanzi, Ofua 6 (Rhino Settlement), Zone 4 (Bidibidi) and Swinga (Bidibidi) are located to the North and host South Sudanese people (for the great majority). The dynamics of refugee flows to the North and the South of the country are very different. In the South, Oruchinga hosts a stable well integrated population, having been long-established in Uganda. Nakivale is another old settlement, with a relatively mixed population that experienced a notable increase in 2015. In the North, new arrivals are more frequent compared with the South. Base Camp is the centre of economic activities in Nakivale

For each settlement, basic socio-economic data were collected, as captured in table 6.

*Table 6 CFGD information*

| Zone | CFGD size | Total population of Zone | Nationality | Average stay length to date |
|---|---|---|---|---|
| **Ofua 6 (Rhino Camp)** | Women: 14; Men: 12; Mixed: 21 | 26,145 | South Sudan | ~3 years |
| **Swinga (Bidibidi)** | Women: 12; Men: 16; Mixed: 14 | 49,024 | South Sudan | ~3 years |
| **Zone 4 (Bidibidi)** | Women: 25; Men: 12; Mixed: 12 | 31,297 (Oct 2018) | South Sudan | ~3 years |
| **Nyumanzi** | Women: 11; Men: 12; | 36,000 | South Sudan | ~3 years |
| **Oruchinga** | Women: 11; Men: 10; Mixed: 15 | 7,350 (April 2019) | DRC, Rwanda, Burundi | 3-25 years |
| **Nakivale Base Camp** | Women: 9; Men: 14 Mixed: 10 | 12,982 | DRC, Burundi | 2-15 years |

Information was also captured on the **goods and services provided to refugees,** in an effort to understand basic needs better. In all zones visited, refugees receive World Food Programme (WFP) food rations; only in Nakivale, could refugees choose between food rations and a monthly cash payment (UGX 31 000). In Oruchinga, only some 221 households receive cash-based interventions.[45] Upon their arrivals, refugees were also given[46] a plot of land to establish their houses, and another plot to cultivate the land, as well as building material to construct their houses and pit latrines. Other core relief material is provided upon arrival, such as jerrycans, mattresses, pans. In Nakivale, starter kits were provided to establish small businesses. Other goods are provided regularly,

[45] Cash-based intervention have started in Oruchinga in December 2018, targeting 221 households including people with special needs.

[46] Refugees are free to use the land, but there is no formal ownership. In Oruchinga for example, a 60x20 meters parcel of land was given for cultivation and a 10x20 parcel for a house. In Nakivale, it was reported that provided plots were 30x30 ft plots, a smaller surface than what was given to refugees who arrived some years back 50x100 ft.

such as soap. Medical care and basic medicines are also provided free of charge. Skills trainings are also provided, as will be discussed.

In all settlements visited, refugees expressed a lack of **livelihood and economic opportunities**. While in the North, reported livelihoods included trading (incl. selling part of the WRP food ration), farming and livestock keeping, brewing alcohol, employment for services, tailoring, physical labor, casual labor, salon work (hairdresser, beauty therapy), brick making, and begging. In the two zones visited in the South, refugees have shown their resilience and developed a wide array of economic activities, creating a vibrant trading centre with coffee shops and taxi services. Additional information on livelihoods of refugees in the 6 visited zones is available under the Economic Analysis sub-section.

In terms of **training**, while some opportunities were offered in each of the six zones, refugees often complained about the selection of trainees, which, they reported, is often based on a random draw rather than on a skills or merit-based selection process. Further, refugees reported that the focus on most training was on youth employment, and many adults found that there was a gap of training opportunities for them, despite a willingness to get upskilled. Finally, another concern was the lack of access to trainings for women, whose days are rhythmed by the opening hours of water points, and whose time is largely occupied by domestic chores, in particular fetching water.

Regarding **water services satisfaction**, the refugees present at the CFGD had generally poor levels of satisfaction, with the exception of Ofua. While there were concerns raised regarding the quality of water in numerous settlements (esp. regarding the levels of chlorine),[47] concerns were overwhelmingly centred around water availability. Water was reported to be released at the water points for short periods, which did not suffice to satisfy the demand. Further, queues to fetch water were reported to be long, and in some places, conflicts between women fetching water are frequent. Water service-related challenges represent a heavy burden for women, as implication of poor services limit opportunities for income-generating activities. The quality of water systems' repair services (in cases of issues of total breakdown) varies from settlement to settlement, it was reported.

The team also investigated the **involvement of refugees in O&M**. Communities' involvement in O&M manifested in two main ways: first, in a duty to clean the water points (which was not always respected, notably in Bidbidi); second, in involvement of refugees in Water Committees. This took place in most settlements, with different levels of engagement (Nyumanyzi, Oruchinga and Nakivale being the most advanced). The most formalized case, which is also a best practice example, is the Water Board in Oruchinga; more details are provided in the next section (Management & Institutions Analysis). It was reported that there are only very few cases of refugees being employed by the service provider to repair defective systems. However, some examples were mentioned, notably in Nakivale, where Nsamisi employs a refugee as an engineer working on the water system.

[47] Partners claim that they maintain free chlorine at 0.3mg/L but there is little evidence that residual chlorine monitoring is being carried out on a regular basis in the distribution network. This is due to lack of field test-kits and/or operators run out of reagents or pillows used in water testing (WESRRP 2019).

Further, the team sought information on **sanitation and hygiene**; while this is not within the formal scope of this assignment, it was thought to be an important parameter to consider when assessing water supply. In general, despite efforts from the community hygiene promoter(s), service providers and UNHCR, sanitation is not yet adequate in refugee settlements. This seem to be linked to a lack of financial means by donors, and a lack of consideration for the longevity of the products distributed. For example, tippy taps, a basic hand washing system, was provided to be set up next to the pit latrines. However, the quality of the taps was reported to be poor; most tippy taps broke under the sun's heat shortly after being installed. Further, it was reported that amount of the soap, given to women exclusively, is not sufficient. Finally, it was reported that only some households have access to a pit latrine, and open defecation is highly widespread. Pit latrines material is given to refugees, but latrines are poorly constructed and cannot be emptied, leading to health and environmental concerns.

Finally, the team investigated the **relationship between refugees and host communities**. However, it must be noted that the focus was placed on host communities in the direct vicinity of refugees, not in the full district. In the zones visited, the relation between the refugee and host community was very cordial. While some incidents were reported at the water point (esp. during dry periods when host community come in high number to fetch water within the refugee settlement), the relationship was mainly positive. In the South, after years of co-habitation, there seem to be integration between groups (marriages, etc.). In some cases, the host communities reported to be satisfied with the venue of refugees, as service did improve.

## 3.2 Institutional analysis

### 3.2.1 Institutional framework

Through the field visit, we found that the key actors involved in the zones under investigation were those described under 3.1.1. Key actors for water supply in refugee settlements, were in particular MWE, OPM, UNHCR, operating partners, and community members. MWE is responsible for water provision in the country, OPM for the protection of refugees throughout the country, and the UNHCR plays its protection and humanitarian mandate with the agreement of the government. Operating partners are appointed by the UNHCR to provide water in settlements for a limited period of time (mandate reviewed every 3 years). In three out of five settlements visited – Bidibidi, Rhino and Nyumanzi – there are numerous implementation partners operating in the same settlement, which is divided in zones. This multiplicity of actors means that there is no single technical institution overseeing the performance and enforcement of integration in design of different systems and ensuring system wide optimization.

Within zones, it was found that **planning decisions** are usually taken by the UNHCR, the OPM, the District, as well as the implementing partner (to avoid duplication of work, partners providing other services in the same zone can be included and consulted during planning sessions). Further, planning can be influenced by a request or referral made by other partners (e.g. protection partners) having identified a particular water-related need

or issue. **Budget decisions** are usually taken by the UNHCR and the partner.[48] Finally, **monitoring activities** are undertaken by the UNHCR and OPM; these two institutions are indeed responsible for the monitoring of partners' activities at all stages of project implementation.

**Coordination** between the different key actors for water service provision (interagency, camp level and sectors coordination) is reported to be efficient and cordial. Based on the key informant interviews undertaken while in field, it was understood that there are three levels of coordination:

- **Coordination at the settlement level:** to ensure coordination within each settlement, meetings are organised on the monthly basis. These meetings include the UNHCR, the only implementing partner(s), OPM and the district officer. In most settlement, this process was reported to work well. On the agenda is usually a discussion of the achievements and gaps in service delivery, as well as the potential solutions to identified challenges. These meeting are an important starting point for advocacy of resource mobilisation.

- **Coordination at regional level**: to ensure coordination between all four settlements in the region, a meeting is organised on a quarterly basis. This meeting includes representatives of the Ministry for Water and Environment, the OPM, the district local government, the UNHCR (responsible for four transit centres and four settlements in the region), UNICEF, implementing agents. In the Southern region, because of the plans to the potential future take-over by NWSC, it was reported that the cooperation is invited.

- Further, it was reported that OPM conducts regular meetings with all stakeholders including the district and sub-county leadership both at the settlement and district level. As reported in the WERRRP, the RDOs, representing OPM at the district level, regularly coordinate with settlement commanders as well as with CAOs and LC5 Chairpersons on issues concerning refugees and the host community (WERRRP, Vol 1).

- **Coordination at National level:** organised in Kampala on a monthly basis, such national meetings include representatives of the OPM, Ministry of Water and Environment, UNHCR, all partners, all refugee hosting districts.

- **Sectoral coordination:** meetings to ensure coordination in specific domains such as WASH are organised within each settlement. These include members of the water board, the service provider(s), and other WASH partners, and the District. On the agenda is usually project updates and discussion of challenges and potential solutions. Sectoral working groups are co-led by OPM DOR and UNHCR. District

[48] This follows the National Strategic Plan (Nsamizi KII). The National Strategic plan is itself informed by HDM report, a refugees' needs survey assessing needs relating to water, health, education etc. HDM research involves all partners (Nsamizi KII).

Sector Officers attend the sector coordination meetings at settlement level, and Line Ministries co-chair some of the sector working groups at central level[49] (WERRRP, Vol 1).

These different forums allow for a diversification of opportunities to coordinate activities, which is described by key stakeholders as highly positive. Institutional coordination is not without challenges, as will be discussed under Chapter 4, Summary of Challenges.

### 3.2.2 UNHCR partners' management in the 6 schemes

In all schemes visited, the water supply system was managed by a UNHCR partner institution.

*Table 7 UNHCR partners in the 6 schemes*

| Zone | Partner | Type |
|---|---|---|
| Ofua 6 (Rhino Camp) | Danish Refugee Council (DRC) | International |
| Swinga (Bidibidi) | Water Mission | International |
| Zone 4 (Bidibidi) | Norwegian Refugee Council (NRC) | International |
| Nyumanzi | Lutheran World Federation (LWF) | International |
| Oruchinga | Nsamizi Institute of Social Development (Nsamizi) [50] | National |
| Nakivale Base Camp | Nsamizi | National |

In some settlements, water services are provided by one entity, while in other, there are many operators covering different zones. In Oruchinga for example, Nsamizi, is currently managing water services in the entire settlement, while in Bidibidi, many operators provide water services. Having only one partner is preferable to minimise costs (overhead or coordination costs, for example), but is not always feasible (KII UNHCR S-W). In some settlements, one sectoral partner operates throughout a settlement (e.g. one WASH partner for a whole settlement), and in other, multi-sectoral (multi-skilled) partners operates in one geography (e.g. one zone in a large settlement).

Throughout refugee settlements, service providers, i.e. the UNHCR's operation or implementation partners, have different characteristics. Water services in settlements are provided by both Ugandan or international NGOs. In Ofua for example, the implementing partner is the DRC, while in Nakivale, the implementing partner is Nsamizi, a Ugandan NGO. According to the UNHCR, there are advantages and disadvantages to both types of actors.

[49] For example, the Ministry of Education is cochairing the Education in Emergencies Working Group; the Ministry of Water and Environment is co chairing the WASH platform meetings

[50] Nsamizi is a Ugandan Public Tertiary Institution specialized in social development training, research, advocacy, outreaches and consultancies.

On the one hand, international partners have usually a better capacity to mobilise resources. For example, LWF is operating in settlements with funding from multiple donors (in fact, it received more funding from other donors than from the UNHCR itself). The UNHCR encourages national partners, like Nsamizi, to write funding proposals to support their activities; while there is good potential for national partners to receive funding from donors focusing on capacitating local actors, efforts to attract funding has so far yield little result. Further, another advantage of international partners over local partners is that they tend to have framework agreements with some international suppliers, because of the large scale of their operations across different countries. This enable them to buy cheaper construction material and spare parts. For example, Water Mission has a framework agreement with Ground Force for pumps at subsidise cost.

On the other hand, national partners have the advantage to be more knowledgeable about national guidelines than international partners. They usually make efforts to align their practices with national ministerial guidelines and policies.[51] This is in accordance with the UNHCR's efforts to align their strategy with national practices when it comes to providing services; this includes a better alignment of O&M practices in settlement, with national practices. The UNHCR has recently adopted a strategy to nationalise the partnerships (together with a capacity building strategy for national entities), to improve sustainability and integration of services in settlements (UNHCR South West, KII). The management of water services in the settlements of Nakivale and Oruchinga has been transferred from the NRC to Nsamizi.

### 3.2.3 Elements of community-based management in the 6 schemes

In some of the zones visited, the partner model is complemented by elements of the community-based approach, which is one of the seven models of water management in Uganda.[52] Oruchinga is a good practice example, where the Government's step-based procedure to introduce a community-based management system was respected, and where the water board is working efficiently.

**Textbox 6: Good practices in terms of community-based involvement in the management of water schemes: the case of Oruchinga**

**Good results relating to the community-based management of the system.** The implementation of a community-based management system and collection of water fees in Oruchinga is a best practice example. While the fees collected are not sufficient to cover O&M cost in full, it helps cover some system-related expenses (e.g. minor pipe repairs). It is also a positive example of the possibility to instil duty of payments in the community's minds. As a Nsamizi representative said: "this is an example of a successful communication of the message that free things cannot be entertained forever". The sensitization campaign led by Nsamizi from February to September 2018 is thought to have helped communities accept water fees.

[51] Some international NGOs have implemented processes without respecting the steps set up by the government in national legislation, leading to some confusion; this was the case with the introduction of a user fee before the introduction of a Water Board in Nakivale.

[52] According to Brown and van der Broek, there are seven models of water management in Uganda: Community Based Management Systems (CBMS); Village Savings and Loan Associations (VSLA) District PPP Approach; Water as a Business; Umbrella Water Authority; NWSC management; and Trade Water Model (Brown & van den Broek, 2018).

**Growing ownership of the water system by the users.** The beneficiaries of the water system were initially not "owning" the infrastructure; this is understandable, as ownership usually starts at the planning phase, and in this case, beneficiaries were not involved in the system's design. While it is challenging to ask users to take ownership of the system in a retrospective manner, Oruchinga is a positive example that communities, through their involvement in Water Boards for example, can take ownership of water infrastructure.

During interviews, members of the Board expressed their satisfaction with "owning the water points people are contributing for". Since the fee was adopted, they feel that "water is closer". They also believe that the population is more cautious about the water infrastructure since the payment was introduced, knowing that their own money is used for repairs.

**Empowered Board.** The Board has voiced its feeling of empowerment to act when Nsamizi is absent, which is very positive for the efficiency and sustainability of the system.

On the other hand, Navivale is an example of a problematic introduction of a community-based management system. In Nakivale, a community-based management system and user fees (firstly set at UGX 500 per month, and later increased to UGX 1,000) have been introduced in 2015 by the international partner which was acting as service provider at the time. The implementation of this sytem was not undertaken in accordance with the national guidelines, and proved to be inefficient and relatively unsuccessful. The user fee has been introduced before the institutional set up was in place, meaning that the community-based water board was not yet created. A user fee was introduced (first applicable to institutions only, and then to the wider community) by the water provider, who understood the need for user fees, but did not grasp the importance of setting a functionning community-based water board to collect and manage that fee (UNHCR Key Informant Interview). Instead, a water user committees system has been introduced in an unstructured manner; members trained to control crowds at the water point, maintain hygiene and collect user fees. Today, the new service provider, Nakivale, and the refugee community do not seem to fully understand how the revenue collected is used by the committee, which is highly problematic. Nsamizi is now making efforts to revert the process and follow Uganda's guidelines in terms of setting a Water Board, in an effort to increase transparency on the use of collected water fees.

In addition to this this major establishment issues, other issues relating to community-based management have been identified. Many water committee members interviewed highlighted their need for uniforms to better define their social status as member of the committee and increase their sense of belonging. The existence of monetary compensation to committee members was also unclear in most settlements visited. Our field study indicated that, there is a general willingness to participate in activities around water services O&M, hygiene and sanitation; in some settlements, refugees were willing to help operate systems on voluntary basis, provided essential facilities and training were availed.[53] In other settings however, (e.g. Swinga Zone 2 in Bidibidi), the

[53] Among the refugee interviewed, there was a general interest to acquire technical skills to help operate and maintain water systems in settlements.

voluntary participation by refugee communities was reported by the DRC to be non-existent or minimal at best, citing a dissatisfaction with lack of budget for remuneration/payment for water user committee members.

In community-based management systems, it is critical that communities take ownership over water infrastructure. This is made difficult by the fact that communities are not consulted during the design of the infrastructure, and by the movement of population in certain settlements (new arrivals, but also refugees returning or being repatriated,[54] moving to a new asylum state, etc.). Ownership can be improved by empowering communities to maintain their system, providing the appropriate incentives or rewards. The payment of user fees is also likely to increase the ownership over water systems.

All in all, many stakeholders interviewed have argued that a community-based approach is not sustainable in the long run,but applying this as a transition phase can be useful prior to transitioning to a utility approach.

### 3.2.4 Planned transition towards a utility approach run by NWSC or UAs

Broadly speaking, the water systems across the refugee settlements are decentralised systems operated by different partners. They provide a mostly *ad-hoc* emergency response water supply service. Due to increasing donor fatigue, it becomes evident that the current system is not sustainable over the long run. Therefore, in the medium to long term, it is advised to begin a gradual transition towards more integrated service provision. To mimic what is done in the rest of Uganda, two models were piloted, as discussed under 3.2: that of community-based and utility-based management.

According to several stakeholders interviewed, both from the UNHCR and the MWE, the utility approach has a greater potential for success in refugee settlements, even though the piloting of the community-based approach is working relatively well in Oruchinga (UNHCR South West).[55] According to Brown and van den Broek, a community-based approach is not suitable due to the complexity and scale of systems in refugee settlement. Community-based models have proven to have relatively low functionality record, and the District Water Officer (DWO), who is responsible for supervising community-based systems is already lacking financial and human capacity to supervise systems outside of settlements. Under such conditions, it sounds difficult to extend its supervision mandate to refugee settlements (Brown & van den Broek, 2018). Other water management systems found in Uganda – such as village savings and loan associations, district public-private partnership, water as a business (operated by Water for People) and Trade Water (operated by Water Mission) are all associated with significant challenges.[56]

In May 2019, the UNHCR and MWE signed a MoU covering water, sanitation and environment. At that time, it was also officially agreed that the utility approach is the preferred long-term solution to management of water and sanitation services (UNHCR, 2019).

[54] The principle of free repatriation is a key principle or "durable solution" of the UNHCR.
[55] The water user committee model is based on a fixed monthly fee, and relies on subsidies (water is treated as a social good).
[56] For a review of these challenges, see (Brown & van den Broek, 2018)

In the long term, it will be necessary to integrate the multiple systems within each settlement in order to graduate to a utility-type system that will benefit from system-wide optimization and economies of scale. It is clear that refugee settlements are becoming established, as well as growing and urbanizing alongside other rural settlements. Therefore, it is envisioned that the constitutionally mandated institutions that manage water in Uganda nationally will take over the management and operation of systems in refugee settlements from the aid agencies, NGOs and donors.

Discussions with numerous actors active on the ground, from UNHCR and partners to DWO representatives and institutions experts reveal that there is no consensus on who, between NWSC and UAs would be best suited to gradually take over the management of refugee settlements. There is a consensus however that this decision should and will be made on a settlement-basis, and that both NWSC and UAs should be equipped with the right capacities, tools and motivational support to ensure a successful transition.

Our review of literature, interviews and analysis revealed that NWSC and UAs both have positive attributes which makes them suitable to manage water supply in refugee settlements. However, challenges were also identified, as highlighted under 5.6.3.

**Textbox 7: Attributes of NWSC and UAs:**

NWSC:

- has an extensive experience of managing large piped water schemes;
- operates according to business principles whilst also helping the MWE to realise government targets to increase water coverage;
- manages schemes in the most cost-efficient way through connecting schemes and economies of scale;
- is able to cross-subsidise less profitable schemes while maintaining standard tariffs levels;
- provides high quality and reliable services (Brown & van den Broek, 2018).

UAs:

- receives support from the MWE and from donors and operates at scale;
- has experience with medium-large sized piped water systems akin to those found in the refugee settlements;
- is willing to engage in the refugee hosting areas and they have a proposal in place over the operation of the schemes in the settlements;
- operates according to business principles to minimise operation costs;
- oversees the funds for O&M and have internal accountability mechanisms in place (under the auspices of MWE);
- is willing to consider the management of handpumps and small-scale systems and have flexibility to charge locally derived tariffs or introduce a pro-poor tariff policy; and finally
- each UA's management of piped schemes encourages uniformity across Uganda

*Source:* (Brown & van den Broek, 2018).

## 3.3 Engineering analysis

As part of the engineering analysis, the project team has gathered, in the six schemes under investigation: 1) technical information on the water system; 2) water use data, 3) data on the capacity of existing infrastructure (Borehole Yield, Daily supply, Number of Pumping Hours, Daily Supply, Per Capita Consumption, People Served); 4) data on storage capacity (Storage Reservoir Capacity, Maximum Day Demand, per capita consumption, people served). Finally, the team also investigated best practices. Per scheme information can be found in the Case Studies report.

### 3.3.1 System characteristics

Five out of the six water supply systems depend on borehole water sources whereas one, Nakivale, depends on surface water source (Lake Nakivale). The boreholes are the water source intakes and are fitted with submersible pumps of varying capacities, with the least being 2m3/hr and the maximum of 72m3/hr. The schemes rely on a variety of energy sources, some of which are hybrid (i.e. relying on more than one source). Five out of six use solar, while 50% (3 out of 6) of the water systems use diesel. Only 1 out of 6 depend on the national grid for electricity. The age of the systems varies between 1 and 4 years with the oldest constructed in 2015. As a result, most of the water systems are in a good condition.

Table 8 summarises the key characteristics of the 6 water schemes.

*Table 8 Key features of the 6 schemes*

| Water System | Technology | Daily Production (m3/day) | Practical capacity (m3/day) | Population Served by Existing Tank Capacity (people) | Population Served by Existing Borehole Source (people) | Maximum capacity of borehole source (people) | Current Population | Future population | % Performance based on borehole* source capacity | Quality of service ** |
|---|---|---|---|---|---|---|---|---|---|---|
| Ofua | Borehole | 400 | 1,152 | 16,667 | 20,000 | 57,600 | 26,145 | 47,221 | 35% | 2.5 |
| Swinga | Borehole | 416 | 640 | 13,333 | 20,800 | 32,000 | 48,456 | 48,456 | 65% | 4 |
| Zone 4 | Borehole | 299 | 552 | 33,333 | 14,950 | 27,000 | 31,297 | 31,297 | 54% | 4 |
| Nyumanzi | Borehole | 109 | 371 | 18,333 | 5,460 | 18,550 | 36,000 | 36,000 | 29% | 2.5 |
| Oruchinga | Borehole | 85 | 147 | 18,333 | 6,050 | 11,341 | 7,272 | 7,272 | 58% | 3 |
| Nakivale | Surface | 144 | 1,056 | 21, 667 | 7,200 | 52,800 | 107,240 | 107,240 | 14% | 3 |

*This is the ratio of the population served by the existing borehole to the maximum population that the borehole source can serve.

** The quality of service is based on the engineering team's expert judgement, based on two key infrastructure properties: 1) the borehole yield and 2) the tank storage capacity, with 5 being excellent and 1 being poor.

The following table provides more details on the characteristics of the 6 schemes under investigation.

*Table 9 infrastructure characteristics of the 6 schemes*

| | Characteristics |
|---|---|
| **Ofua** | • A borehole of yield 72m³/hr. the borehole is installed with a pump that delivers 50m³/hr;<br>• A transmission main of OD 110 HDPE PN16 which is 4.8Km;<br>• 190 solar panels with each having a capacity of 275 Watts;<br>• A chemical house with an online chlorine dosing facility (DOSATRON- D205) with a capacity to dose a maximum flow rate of 20m³/hr, and a tank of 500 litres;<br>• A reservoir tank of capacity 100m³ on a 12m high tower located at Ofua 6 health centre;<br>• A distribution network that serves Blocks A, B, C, D in Ofua 6 as well as the host community in Wanguru village. (The length of the distribution network and pipe details could not be established);<br>• The water supply system has 22 public standpipes, 5 of which are in the host community;<br>• Every public standpipe has a solar powered lamp besides it so that they can be accessible during the night. |
| **Swinga** | • A borehole of yield 40m³/hr. the borehole is installed with a pump that delivers 32m³/hr.;<br>• A transmission main of OD 110 HDPE PN16 which is 3.5Km;<br>• 260 solar panels with each having a capacity of 260 Watts;<br>• A Diesel Generator of capacity 88kVA;<br>• A reservoir tank of capacity 80m³ on a 15m high tower;<br>• A distribution network that serves villages 1, 2, 6, 7, 9, 10, 11 and part of three as well as the host communities in the villages of Nkubuwa, and Yayeri in Kochi sub-county. (The length of the distribution network and pipe details could not be established);<br>• The water supply system has 30 public standpipes, three of which are in the host community. Every public standpipe has a solar powered lamp. |
| **Zone 4** | • An artesian well of yield 23m³/hr. This is an estimated well yield for the borehole. The water flows from the Artesian well through a pipe to a 500m³ water sump;<br>• A transmission main of OD 110 HDPE PN16 which is 7.0 Km;<br>• 68 solar panels with each having a capacity of 275 Watts;<br>• Currently there is no chemical dosing facility but its installation is planned. Chlorine for disinfection is directly poured into the collection tanks;<br>• A water trucking facility that consists of 2 tanks of 75m³ capacity and 1 tank of 95m³, a water pump and delivery pipe for loading the trucks that have capacity of 10m³ each. Water trucking is still being carried out with target areas of communal tanks in the villages of 9, and 10 as well as the health centre. Currently trucking is at 36m³/day;<br>• A reservoir tank of capacity 200m³ on a 10m high tower;<br>• A distribution network that serves villages 5, 6, 8, 9 and 10 as well as the host community in Aranga, Kulikuli, Kulikulinga, Drimberu, Igamara and Kado village. (The length of the distribution network and pipe details could not be established);<br>• The water supply system has 27 public standpipes in the refugee settlement and 14 in the host community;<br>• Every public standpipe has a solar powered lamp besides it so that they can be accessible during the night. |
| **Nyumanzi** | • A borehole of yield 3.6m³/hr equipped with a submersible water pump;<br>• 32 solar panels of capacity 265 Watts;<br>• A diesel generator of 10kVA for backup supply; |

| | |
|---|---|
| | • A transmission pumping main of OD 75mm HDPE;<br>• A chemical dosing facility;<br>• A ground cylindrical steel tank of 70m$^3$ capacity placed on a 1m high level compacted soil platform acts as the storage reservoir;<br>• The distribution network of approximately 1.5km total length consisting of mainly HDPE pipes of sizes ranging from OD50-OD63 is laid so far. Water is dispensed through 6 public stand posts, five of which are located within the community and one is located at the community center. |
| **Oruchinga** | • Nshyugezi Health Centre Water Supply System;<br>• Base Camp Water Supply System;<br>• Supply from 26 number shallow and deep wells installed with handpumps. Some are functional, others are not. |
| **Nakivale** | • An intake channel that was created from the lake to allow water to flow by gravity to a pond of volume 480m$^3$;<br>• A suction pipe of DN 150 from the pond connecting to the raw water pumps;<br>• The raw water pumps have a capacity of 18 to 66m$^3$/hr over a pumping head of 37m to 27m;<br>• Power supply is a hybrid of National Power Grid managed by UMEME and a standby generator of 100kVA and another one of 30kVA;<br>• A transmission main of OD 160 HDPE which is 0.5Km and connects to the two water treatment plants, the one of continuous flow, one without a continuous flow and settling tanks;<br>• The non-continuous flow consists of a rapid mixing chamber for pre-chlorination (kill the algae), after which Soda Ash is dosed. The soda ash raises the PH for optimum operation conditions for Alum. Water moves through the horizontal flow baffle walls into two sedimentation tanks of total capacity 100m,$^3$ where they are kept for two to three hours so that settlement can occur. This system was constructed by ARC in 2017;<br>• The settling tanks are of capacity 70m$^3$ and 90m$^3$. In these settling tanks, water is filled, and Alum directly dosed in them. The water is left for three hours so that settlement can occur, after which the sludge is drained out and the clear water remains which is then channelled to the chlorine dosing chambers and then clear water tanks;<br>• Continuous system that consists of a pre-chlorination, Soda Ash dozing, Alum dozing, rapid mixing and flocculation, sedimentation and slow sand filtration. Water is taken to the chlorine dosing tanks. This process does not stop as long as there is raw water inflow. The continuous system has a capacity of 22m$^3$/hr. This system was constructed by Nsamizi with funding from UNHCR and was commissioned in 2016;<br>• All the water from the three systems is channel to a chlorine dosing tank and then to a sump where it is pumped to the reservoir tanks in base camp. The sumps are installed with submersible pumps of capacity 30m$^3$/hr;<br>• The transmission system is seven kilometres long to the base camp reservoir;<br>• The water is delivered to 90m$^3$ steel tank on a 12 meters high tower in the centre of Basecamp and another storage system that consists of four plastic tanks with total capacity of 40m$^3$ on a 10m high tower;<br>• The distribution network covers the whole of Base. The length of the distribution network and pipe details could not be established;<br>• The water supply system has 21 public standpipes in the refugee settlement and 14 in the host community. |

Despite relatively good conditions of the water systems' infrastructure, the systems' capacity utilisation, performance, transparency and predictability can be improved (as described under 5.3). Our field visit revealed a high level of demand-related pressure on existing infrastructure. To frame these challenges, the project team undertook a capacity utilisation analysis to understand water system efficiency. The analysis is presented in the Challenges section.

### 3.3.2 O&M costs

The O&M estimated costs for the six water systems are presented in Table 10 below.

*Table 10 O&M costs for the water systems*

| Sno | Location | Daily Supply ($m^3$/month) | O&M Costs (USD/month) | O&M Cost/M3 (USD/m3) |
|---|---|---|---|---|
| 1 | Ofua | 12,000 | 882 | 0.07 |
| 2 | Swinga | 12,480 | 1,567 | 0.13 |
| 3 | Zone 4 | 8,970 | 1,120 | 0.12 |
| 4 | Nyumanzi | 3,270 | 1,287 | 0.39 |
| 5 | Oruchinga | 3,630 | 934 | 0.26 |
| 6 | Nakivale | 4,320 | 19,770 | 4.58 |

The results show that there is a variability in O&M costs per $m^3$ for the different water supply systems. This can be attributed to the variability in energy mix and to the water quality issues that require specific treatment regimes. Except for Nakivale, the O&M costs are low and are within 0.09-0.8 USD/$m^3$ as per the findings of Andreasi Bassi et.al. (2018) because majority of the systems are solar powered (Andreasi Bassi, et al., 2018). It should however be noted that there was no evidence of how capital investment costs were funded. This was mainly because systems supplying refugees are perceived by many Ugandans to be a temporary venture whose replacement will be due when the settlements are closed. The protracted characteristic of most refugees' stay in Uganda is not always understood or acknowledged.

There is lack of a clear asset management and monitoring system in the visited refugee settlements. O&M of the water supply systems was based on a reactive approach to break-down maintenance rather than on a proactive approach. Lastly, across the six sites there was a lack of a clear system to document O&M.

### 3.3.3 Capacity utilisation and performance evaluation

Capacity utilisation or capacity performance is the ratio of actual production against system capacity. The measure is used to assess water system efficiency (i.e. to check the utility of the water system). It is used to assess system redundancy by relating a percentage of how much a designed system is being utilised to supply water to the communities.

The utilisation rate, in other words the performance,[57] of the six systems stands at an average of 37% with the least being at Nakivale at 14% and the highest being at 65% at Swinga. Details on the utilisation rate for the existing systems is presented in Table 11. The average plant capacity utilisation of 37% is very low compared to the capacity utilisation of NWSC regions of Kampala, Central, Eastern and Northern and Western and Southern which stood at 93%, 65%, 43%, 67% respectively in 2017.

[57] Utilisation rate or performance is the current production divided by practical capacity (or maximum production) based on a maximum pumping period of 16 hours. A score of 100% would mean that the current production of the water meets the maximum production capacity of the water source.

*Table 11 Assessment of the pressure on the infrastructure and performance for the systems in the project area*

| Sno | Water System | Technology | Daily Production (m3/day) | Practical capacity (m3/day) | Utilisation rate (% performance) | Quality of service/5 | User Fees |
|---|---|---|---|---|---|---|---|
| 1 | Ofua | Borehole/Solar | 400 | 1,152 | 35% | 2.50 | No |
| 2 | Swinga | Borehole/Solar + Diesel Generator | 416 | 640 | 65% | 4.00 | No |
| 3 | Zone 4 | Borehole/Solar | 299 | 552 | 54% | 4.00 | No |
| 4 | Nyumanzi | Borehole/Solar + Diesel Generator | 109 | 371 | 29% | 2.50 | Yes |
| 5 | Oruchinga | Borehole/Solar | 85 | 147 | 58% | 3.00 | Yes |
| 6 | Nakivale | Surface/HEP+Standby generator | 144 | 1,056 | 14% | 3.00 | Yes |
| | Project Global | | 1,453 | 3,918 | 37% | 3.2 | |

The difference between the capacity of the system in places with or without user fees was also investigated and the results are presented in the Table below. The results show that systems with no user fees have a utilization rate that is 26% higher than systems with user fees. This correlation might suggest that user fees impact system utilization rate in refugee settlements for the six systems, but it might also suggest that user fees are only accepted by the population served by systems with high utilization rate. A causal relation between the two variables was not established.

*Table 12 Assessment of utilization rate and user fees*

| Sno | Water System | Daily Production (m3/day) | Available capacity (m3/day) | Utilisation rate (% performance) |
|---|---|---|---|---|
| 1 | With User Fees Global | 338 | 1574 | 21% |
| 2 | With No User Fees Global | 1,115 | 2,344 | 48% |
| 3 | Project Global | 1,453 | 3,918 | 37% |

### 3.3.4 System quality

The quality of the six systems has been measured based on a qualitative assessment undertaken during the field visits. The assessment made by the engineering team, on the basis of observations, KIIs and CFGDs, was based on a five-point Linkert scale qualifying the condition of the system, according to the following: 1-Poor, 2-Fair, 3-Good, 4-Very good and 5-Excellent. The results show that the systems in Swinga and Zone 4 are of best quality while Nyumanzi and Ofua, quality is lower. The overall quality of the systems was assessed to 3.2 (64% of performance), which is good.

*Table 13 Systems quality*

| Water System | Quality of service |
|---|---|
| Ofua | 2.5 |
| Swinga | 4 |
| Zone 4 | 4 |
| Nyumanzi | 2.5 |
| Oruchinga | 3 |
| Nakivale | 3 |

### 3.3.5 Water demand & system pressure

An assessment of water demand and system pressure was undertaken. The system characteristics such as tank capacity and maximum capacity of water source capacity were obtained from field findings and can be found in the Case Studies report.

Table 14 shows the relationship between current and future water demand and the capacity of the system for the six investigated systems; it also shows the relationship between current and future water demand and water source capacity.

In terms of the system's characteristics, introductory information should be provided:

- The **population that could be served by existing tank capacity** (column a) looks at the capacity of the tank (or storage) to supply the population for eight hours (33% of the day) – this is converted in person equivalence; in other words, the tank capacity column shows how many people can be supplied by the existing tank within an eight hour window.
- The **population that could be served by the existing water source and current operational conditions** (column b) assumes 20 litres per person per day. It is calculated by dividing the volumetric capacity of the source by the per capita use.
- The **maximum population that the existing water source can serve at full operation capacity** (column c) related to the maximum capacity of water source, assuming the infrastructure is adequate (adequate tank capacity, which is some case means that the tank size must be increased, but also sufficient energy to pump for 16 hours, etc.).
- The **current population** is the population in the said zone (based on data gathered in field).
- The **future population** is the projected population by 2040.[58]

[58] The population growth was estimated based on population growth projections from the Uganda bureau of statistics.

*Table 14 Systems characteristics in the six water schemes investigated*

| SNO | Water system | System Characteristics | | | Current population (2019) (d) | Future population (2040) (f) | System Pressure | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Population that could be served by existing tank capacity (a) | Population that could be served by existing water source and operation conditions (b) | Maximum population that the existing water source can serve at full operation capacity (c) | | | Capacity of existing tank to serve future population demand (a/f) | Capacity of existing tank to serve future population demand (a/f) | Full operation capacity of water source to serve current population demand (c/d) | Capacity of full operation capacity of water source to serve future population demand (c/f) |
| 1 | **Ofua** | 16,667 | 20,000 | 57,600 | 26,145 | 47,221 | 64% | 35% | 220% | 122% |
| 2 | **Swinga** | 13,333 | 20,800 | 32,000 | 48,456 | 87,517 | 28% | 15% | 66% | 37% |
| 3 | **Zone 4** | 33,333 | 14,950 | 27,000 | 31,297 | 56,526 | 107% | 59% | 86% | 48% |
| 4 | **Nyumanzi** | 18,333 | 5,460 | 18,550 | 36,000 | 65,020 | 51% | 28% | 52% | 29% |
| 5 | **Oruchinga** | 18,333 | 6,050 | 11,341 | 7,272 | 13,134 | 252% | 140% | 156% | 86% |
| 6 | **Nakivale** | 21,667 | 7,200 | 52,800 | 107,240 | 193,687 | 20% | 11% | 49% | 27% |

Two sets of analyses were undertaken. The first analysis aims at understanding the capacity of the infrastructure, tank size being used as a proxy;[59] in this analysis, it is assumed that the infrastructure is used at maximum capacity, meaning that there is enough water in the source, enough energy for pumping, etc.

- Regarding the **capacity of the tank to serve current population demand (a/d),** current demand can be met in all settlements but Swinga and Nakivale (where numbers are below 33%), if the infrastructure is used at maximum capacity. Storage tanks for four out of six (66%) of the schemes (Ofua, Zone 4, Nyumanzi and Oruchinga) have the capability to have the potential to adequately meet the current operation demand. In Oruchinga and Zone 4, numbers show that tank capacity is oversized compared to the source of water (numbers under a is bigger than under c).[60]

- Regarding **the capacity of the tank to serve future population demand (a/f) if used at full capacity,** only Ofua, Zone 4 and Oruchinga would be able to serve the future population's water demand (future demand is assumed to be constant, with 20 liters per person a day) – this appears in the table as their capacity is above 33%.

The second analysis looks at the capacity of water sources to serve current demand, assuming that the tank capacity is adequate, and that sufficient energy is harnessed to pump water; this, in some cases, would mean that the tank capacity would have to be upgraded.

[59] Little information on pipe size and other components is available.
[60] This is likely explained by a design made based on population demands rather than source capacity, and with the assumption that other water sources could be added to the system supplying the pump.

- Regarding **capacity of the water source to serve current demand (c/d),** only water sources in Ofua and Oruchinga would be able to fully meet the current population's needs (capacity is above 100%), if infrastructure was adequate.

- Regarding **capacity of the water source to serve future demand (c/f),** only the water source in Ofua would be able to fully meet the current population's needs (capacity is above 100%), if infrastructure was adequate.

This analysis shows the tank capacity of existing systems must be enhanced, and additional water sources should be added.

**Textbox 8: Suitability of the infrastructure for a transition to a utility-based model**

Sustainable solutions should be adopted to ensure that water supply and tank capacity can ensure that future demand is met. Unfortunately, augmenting systems capability and extending existing systems to ensure adequate and reliable water supply will be a complex task. This should be flagged as an important factor to the suitability of the infrastructure for a transition to a utility-based model: additional water sources would be needed in most settlements investigated, and investment to increase tank storage size should be made in Swinga, Nakivale and Nyumanzi.

### 3.3.6 Good practices

To address these challenges, stakeholders involved in supplying water to refugee settlements have been taking some measures – both proactively and reactively. Textbox 9 highlights some of these good practices.

**Textbox 9: Good practices**

**Efforts to increasing storage capacity in Ofua.** The DRC is currently working with Water Missions on improving water storage capacity in Ofua, by constructing water storage facilities. The increased storage will be key in times of system breakdowns, and useful during the night when the pumping system is not operational.

**Efforts to diversify the water mix in Ofua.** The UNHCR is investigating the possibility for rainwater harvesting to diversify water sources during the rainy season. Pilot rain harvesting projects have been undertaken in public institutions such as schools and clinics (KII UNHCR). Engaging in rainwater harvesting will reduce pressure on system during the rainy season. It should however be noted that promotion of rain harvesting at the household level would require the change of the roofing materials, from grass thatched to iron sheets.

**Hybrid energy to increase pumping timeframe in Swinga.** The water supply system in Swinga currently depends on a hybrid of solar energy and diesel-powered generator. The use of diesel generators increases the pumping duration, and improved the service to users, especially when solar energy is insufficient; diversifying energy sources also decreases risks of scarcity in case of system break down. It must however be noted that the use of the diesel generator increases the O&M costs of the water supply system.

**Free flow to save energy and reduce costs in Bidibidi.** The free flow of water from the artesian well to the collection sump helps save energy, spare equipment and reduce costs since water is freely delivered to a collection sump where it is further pumped to the main reservoir tanks. The artesian well in Zone 4 currently delivers about 23$m^3$/hr.

**Addressing water shortages in Nyumanzi.** Recognising water shortages is a great challenge in the settlement, the MWE, through the Water and Sanitation Development Facility (North), has adopted a plan for a new water supply system. A contractor has been appointed and construction has begun. In addition, a pilot project aimed at constructing plants to remove salts from borehole water is said to be in the government's project pipeline.

**Alternative Water Sources in Nakivale.** The UNCHR drilled two production wells that will be used as alternative sources of water to the primary source, Lake Nakivale. This will also help decrease O&M costs, Lake water treatment process being highly expensive.

## 3.4 Economic analysis of current and potential user fees

The economic analysis of water supply systems in selected refugee sites investigated the potential for the implementation of user fees. This analysis is structured in four sections. Firstly, the analysis compares settlements where user fees are and are not being applied to understand whether the user fee has a discernible impact on the quality and sustainability of the service, as well as the customer satisfaction of the service. Secondly, the customer base for water supply systems in each settlement is analysed in terms of ability to pay (household income and the sustainability of livelihoods), as well as willingness to pay. Thirdly, the costs of each system are analysed to understand the affordability of water supply in each settlement based on their respective prevailing socio-economic context. The last section builds on the previous analyses to establish recommendations toward a pragmatic approach for establishing a user fee in the selected sites.

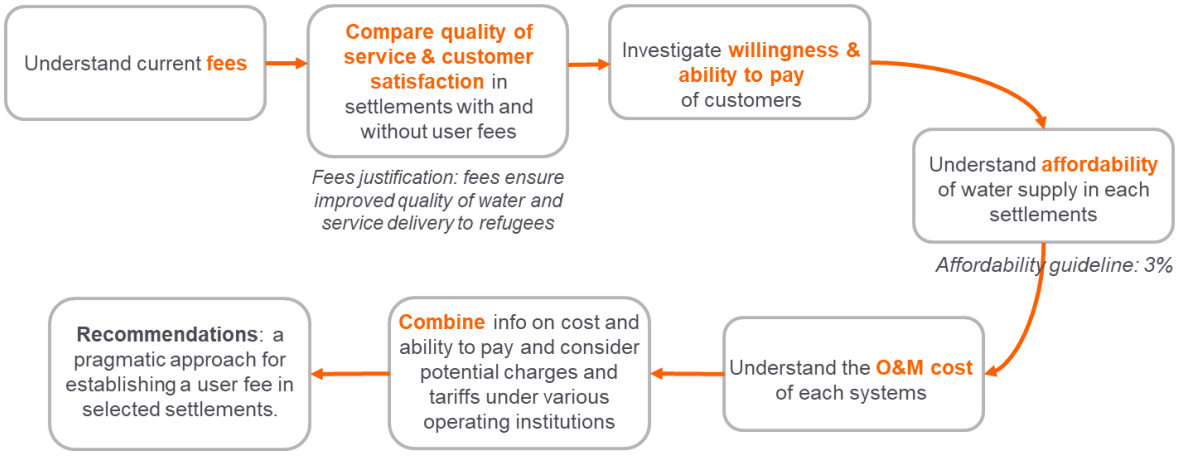



*Figure 16 Schematic representation of steps taken*

In undertaking the analysis across all sections, the analysis draws heavily on the results of the household survey. Given the relatively small samples used in this survey, it is important to be clear about the reliability that can be attached to the results from this survey; Textbox 10 discusses further.

**Textbox 10: Reliability Test**

Given the small sample size in each of the sites surveyed, it was necessary to check the internal consistency of the survey results in order to validate the preliminary insights that were drawn, as well as to justify undertaking larger and more frequent surveys across more refugee settlements. To this end, standard checks on the correlation between reported income with household expenditure, household savings, and ownership of consumer goods (cell phone) were conducted both across and within settlements.

Reported income is strongly positively correlated to household expenditure across the settlements with a correlation coefficient $r = 0.760$ ($p < 0.01$). A similar relationship is evident in Swinga ($r = 0.698$, $p < 0.05$) as well as Nyumanzi ($r = 0.910$, $p < 0.01$). Although not statistically significant, moderate and weak positive correlation is also evident in Oruchinga, and Ofua 6. Respondents in Nakivale and Zone 4 did not report household expenditure and so this correlation could not be tested in these settlements.

Reported income has a weak but negative correlation to access to savings across refugee settlements ($r = -0.23$, $p < 0.01$). This may be indicative of the tendency in the refugee context to under report financial capacity given vulnerability and reliance on external/aid support in the process of establishing themselves in a new country. The same correlation test within each settlement yielded statistically insignificant results for all settlements except Swinga where the same relationship was evident ($r = -0.498$, $p < 0.01$).

Similarly, the correlation between reported income and owning a durable consumer good (in this case a cellphone) was also weakly negative across the settlements ($r = -0.23$, $p < 0.01$), as well as within Zone 4 ($r = -0.396$) and Ofua 6 ($r = -0.430$), significant at the 99% level, and Swinga ($r = -0.329$), significant at the 95% level.

In summary, these tests suggest that there are a number of correlations that are consistent with prior expectations – especially as between income and consumption – which gives confidence that the results can be used in undertaking valuable preliminary analysis. However, the surprising results as between report income and savings and owning a durable consumer good, suggests that further survey work may be valuable to strengthen or corroborate the results presented in this section, such as including a comparison between income dynamics in refugee versus host populations.

### 3.4.1 Current user fees in pilot refugee settlements in Uganda

Water use charging is currently applied in Nyumanzi, Oruchinga and Nakivale. While the official rate reported by water providers is UGX 1000 per month, households reported paying between UGX 500 – 10,000 monthly. The mean monthly reported water payments in each are summarised in Table 15. It is worth noting that 20% of households in Swinga settlement reported making water payments (UGX 1000), despite no fee being formally established here.

*Table 15 Existing average water use charges*

| | Nakivale | Oruchinga | Nyumanzi |
|---|---|---|---|
| Average monthly water charge per household | UGX 1167 | UGX 1429 | UGX 1121 |

In order to justify the establishment of water use fees more widely throughout Ugandan refugee settlements, the contribution of fees should **a) ensure improved quality of water and service delivery** to refugees, and **b) remain affordable.** The wider literature suggests that water charging might be unaffordable if it constitutes more than 3 – 5% of household income in formalised settlements (Damme, et al., 1984) (Mcphail & Bank, 1993) (Saunders & Warford, 1976). Using the lower bound of this ratio as a guide for affordability in refugee settlements and comparing the average monthly charge with the median income in each settlement it is clear that the current official fee is affordable where households are earning approximately the median monthly income and above.

In the sites of focus, the impact of water use charging on the water service is measured against the quality of service in settlements where no fees are being charged. The perceptions around water service reliability, water quality and the quantity of water provide indications of customer satisfaction with the existing water systems. Figure 17 provides an overarching comparison, looking at the overall satisfaction with water supply. Two out of three households in settlements where there are water fees consider the overall service to be good, while in settlements without water charging this ratio drops to just one in three households. These results were further tested in a linear regression analysis where a weak but positive correlation exists between paying for water as perceiving water quality and service as acceptable.[61]

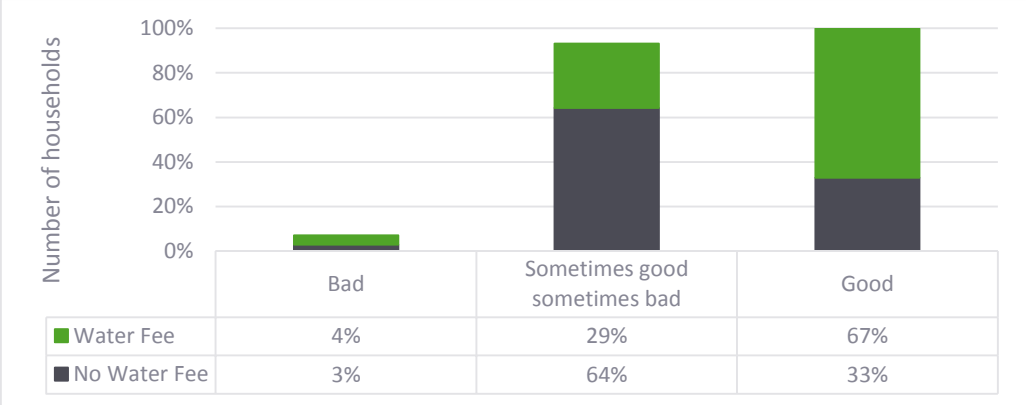



*Figure 17 Overall customer perception comparison*

[61] Where paying for water is coded as (1-Yes, 2-No) and the reliability, consistency and quantity are coded as (1=Bad, 2-sometimes good/sometimes bad, 3-Good), the regression results showed a negative relationship with r = -0.270 (reliability); r = -0.316 (consistency); r = -0.307 (quantity). These results, significant at the 99% level, suggest that paying water is indeed associated with improved service in refugee settlements.

Furthermore, it appears that the majority of fee payers in Nyumanzi (78%), Oruchinga (96%) and Nakivale (83%) feel confident and trust in the organisations administering and maintaining the water systems in these settlements.

The Oruchinga and Nakivale settlements appear to have the most successful water and user fee system in operation, based on the trust the communities have in the operators, as well as the reported satisfaction with the systems. In Oruchinga, the system is operated by a dedicated WASH agency with specialism in social development training, research, advocacy, outreach and consultancy. However, the refugee community's involvement in the water system is longstanding with a community-based management structure, a water board, elected by the community and in charge of managing the water points and fee collection. It appears that the combination of a well-capacitated operating partner and well engaged community association are necessary institutional structures for successful water supply systems. Including and enabling the refugee community to participate in the process is essential, not only to ensure effective communication but to ensure refugees are part of establishing the fee based on their means and facilitating the introduction of these new processes. This has been demonstrated in Oruchinga where user fees and the importance of contribution are communicated during committee meetings and through awareness programmes.

In Nakvivale, the process of establishing a payment system has not been as successful, despite the relative satisfaction reported in the illustrative survey of the current system. The user fee was introduced in 2015 but without the engagement and inclusion of the refugee community in the process. Water user committees were established from the top down, by donors and agencies without appropriate engagement and inclusion of the broader refugee community. This comparison shows that the process of introducing and setting a fee must be guided by the refugee community from the start.

In summary, while care needs to be taken about the interpretation of the results from a relatively small survey, there is evidence suggesting a strong correlation between water use charging and positive perceptions of water services quality and overall satisfaction with the service being provided. It therefore supports the importance of considering options for user charging from the perspective of households living in settlements.

### 3.4.2 Ability and willingness to pay

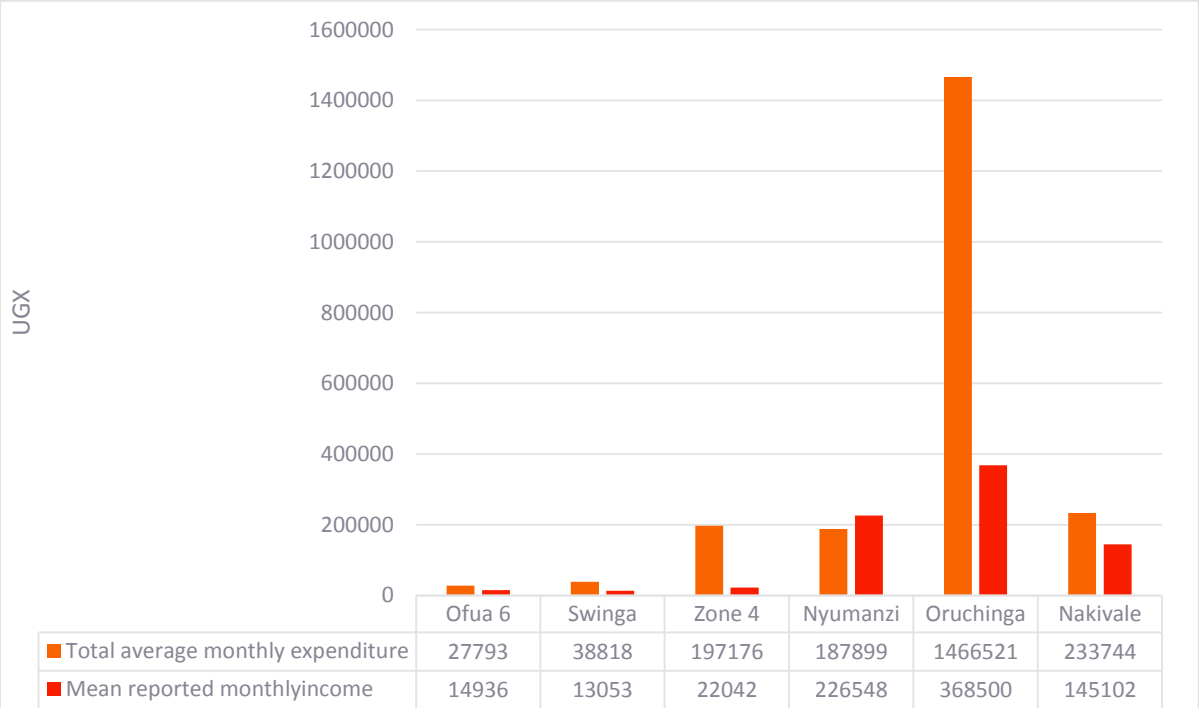
This section investigates whether refugees are able and willing to pay a reasonable contribution toward cost recovery for the water supply systems in selected sites. The sources and distribution of reported income for each settlement are outlined and analysed below and then compared to reported household expenditure as a proxy for income. Ability to pay is then analysed in relation to refugees' willingness to pay.

**Ability to pay** is understood in terms of reported income, monthly expenditure, as well as access and ability to savings in each of the sites of focus. When taken together, these measures provide a more complete indication of socio-economic conditions for refugees in different settlements.

The illustrative household survey suggests that refugees in Ofua 6 are predominantly poor, with average household income in the sample being UGX 14936 and median income being UGX 5000. The distribution of

income in Ofua 6 is such that 70% of the households in the sample earn less than UGX 20 000 (USD 5.32) per month.[62] The economic context in Swinga is similar to Ofua 6 with a mean household income of UGX 13 053, and 80% of the sample earning less than UGX 20 000 per month. The prevailing economic conditions in Zone 4, as illustrated by the household survey, are again characterized by low incomes, with mean income being UGX 22 042 and 79% of the sample surveyed earning less than UGX 15 000.

Conversely, the prevailing economic conditions are markedly better than the settlements above in Nyumanzi, Oruchinga and Nakivale. In Nyumanzi, the mean income is UGX 226 548 and the median income is UGX 248 000 in the sample, suggesting a fairly symmetrical distribution and that earnings in Nyumanzi are higher on average than other settlements. Here, 60% of the sample also reported earning UGX 240 000 (USD 63.85) per month. Oruchinga has an average income of UGX 368 500, however the median income (a more accurate central measure in this case) is UGX 70 000. Of the refugees surveyed in Oruchinga, 75% earn less than 150 000. Lastly, in Nakivale, the mean income is UGX 145 102, and the median income is UGX 100 000 per month with more than half the sample earning above this value.




| | Ofua 6 | Swinga | Zone 4 | Nyumanzi | Oruchinga | Nakivale |
|---|---|---|---|---|---|---|
| Total average monthly expenditure | 27793 | 38818 | 197176 | 187899 | 1466521 | 233744 |
| Mean reported monthlyincome | 14936 | 13053 | 22042 | 226548 | 368500 | 145102 |

*Figure 18 Reported household income vs. expenditure*

It is notable that in all settlements a proportion of refugees reported earning *zero* monthly income. Reported income is compared to reported monthly expenses as a proxy measure for household earnings in Figure 18. In all settlements reported income is lower than the total value of household expenditure for the month (approximately half of expenditure), with the exception of Nyumanzi where reported income was higher than reported expenditure. Oruchinga settlement presents an interesting case with both very high maximum

[62] The distribution of income for each settlement is shown in APPENDIX A.

reported earnings, as well as very high monthly expenditure. This may suggest that there are a small proportion of wealthy refugees who have established successful lives in Uganda in this particular settlement.

The household survey also illustrates that refugees are involved in a wide variety of income-earning activities (See **Error! Reference source not found.**). The range of income sources is fairly specific to particular settlements.

- Refugees in Ofua 6 are widely involved in trading (50%), farming and livestock keeping (42%), with less than 10% relying on cash transfers. Hence, while monthly income is low, the survey suggests that refugees in Ofua 6 have access to land and local markets which may support sustainable livelihoods with further support.
- In Swinga, there is greater diversity in economic activity and income source including farming, building and trading home-made products (such as farmed produced or brewed alcohol). A considerable proportion (24%) of the sample, however, sell their food rations for an income which flags that many refugees have to rely on unsustainable practices to forge a livelihood.
- Trading, farming and livestock keeping are the predominant sources of income in Zone 4, with higher average income suggesting these activities may be more productive here than in Ofua 6 or Swinga. There is evidence of formal salaried employment in Zone 4, which again suggests slightly improved economic conditions. However, 15% of refugees surveyed rely on the sale of food rations to earn an income in this settlement, suggesting there remains a proportion of the population who are vulnerable.
- The majority (68%) of the refugees in the Nyumanzi sample rely on cash transfers from various donors and aid agencies which suggests that refugees may not have established sustainable and self-reliant livelihood opportunities within this settlement, but that cash-based incentives and transfers are having a positive impact on socio-economic life.
- Refugees in Oruchinga may not have the highest earnings but appear to have higher economic resilience when considering the sources of refugee income. There is less reliance on cash transfers, sale of food rations and remittances in Oruchinga, as compared to other settlements.
- Refugees in Nakivale rely mostly on farming and livestock keeping for income with trading and a small proportion of salaried employment. However, income from begging, sale of food rations and casual work suggests a proportion of vulnerable refugees without sustainable livelihood options.

In summary, the reported and proxy measures of income discussed above indicate that ability to pay is strongest in Oruchinga, Nyumanzi and Nakivale where refugee households benefit from either cash transfers or a diverse range of income earning opportunities that include more sustainable livelihoods (such as salaried employment). Conversely refugees in Ofua 6, Swinga, and Zone 4 appear to be far less able to pay for basic services where incomes are generally lower, and where income earning activities are more precarious.

The ability to save is the final measure of financial security considered at this stage of this assignment. It is notable that access to savings is generally higher in settlements where refugees have higher earning potential, apart from Nyumanzi. This may suggest that the cash transfers in operation in this settlement cover only the essentials and the ability to save is constrained without more and different income earning opportunities.

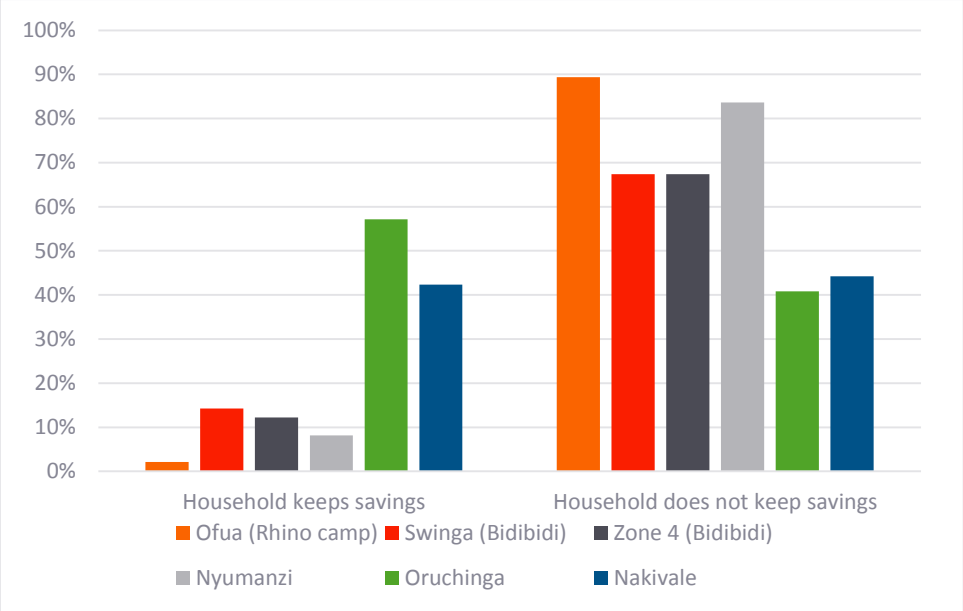



*Figure 19 Access to savings*

The reported and proxy measures of income discussed above indicate that ability to pay is strongest in Oruchinga, Nyumanzi and Nakivale where refugee households benefit from a diverse range of income earning opportunities that include more sustainable livelihoods (such as salaried employment). The survey indicated higher monthly earning potential in these settlements, as well as better access to savings in Oruchinga and Nakivale specifically. Conversely refugees in Ofua 6, Swinga, and Zone 4 appear to be far less able to pay for basic services where incomes and access to savings are generally lower, and where income earning activities are more precarious.

**Willingness to pay** is assessed through direct questions to surveyed refugees about their inclination to contribute to the O&M costs of the water they receive. In each settlement, respondents were asked whether they were willing to pay for water services in general, as well as their willingness to pay for specific improvements in or components of the systems, such as improved water quality or spare parts. It is clear that willingness to pay for water services is higher in settlements where charges are already established (Nyumanzi, Oruchinga and Nakivale). In addition, it may be that a stronger ability to pay informs higher willingness to pay in these settlements. Figure 20 summarises the values reported across all sites in response to the question "How much are you willing to pay for water services per month?"

Those who were willing to pay, reported willingness to pay between UGX 100 – 10 000 monthly. The majority of these respondents reside in Nakivale, Nyumanzi or Oruchinga. It is notable that the most common reported value is that of the current user fee charged in select sites, UGX 1000. There is a strong ***unwillingness*** to pay for water services in Ofua 6, where only a single household expressed a willingness to pay to the value of UGX 1000. A similar, though less extreme lack in willingness is indicated in Swinga and Zone 4.

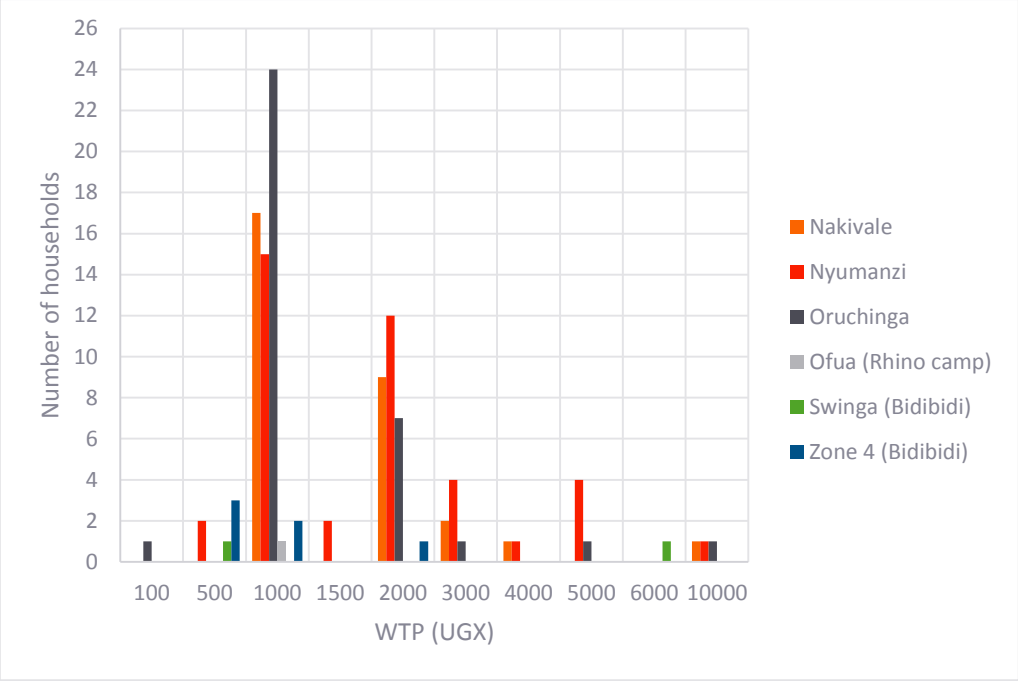



*Figure 20 Summary of general willingness to pay across refugee settlements*

Looking deeper into the key concerns around willingness to pay, Figure 21 shows whether respondents[63] across the sites of focus would be willing to pay for specific improvements in their current service. Based on the mean values proffered, it is notable that water quality is key issue in Oruchinga and Swinga, while accessibility (or closeness to water point) is the most pressing in Nyumanzi.

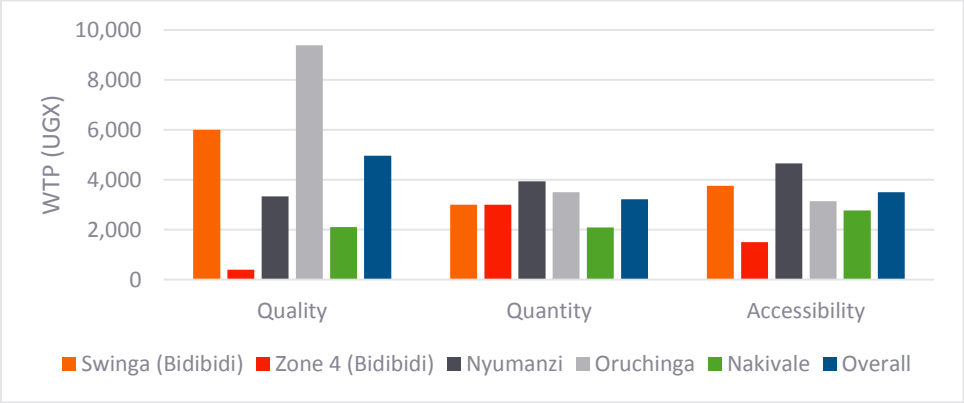



*Figure 21 Key willingness to pay Issues*

### 3.4.3 Costs

The analysis of costs is based solely on the O&M requirements of the selected refugee water supply systems. It is assumed that capital requirements for infrastructure as well as the cost of any capacity and institutional building would be financed by development partners and/or national government (Githiri, April 2019).

[63] Ofua 6 is excluded from this particular analysis for lack of willingness to pay.

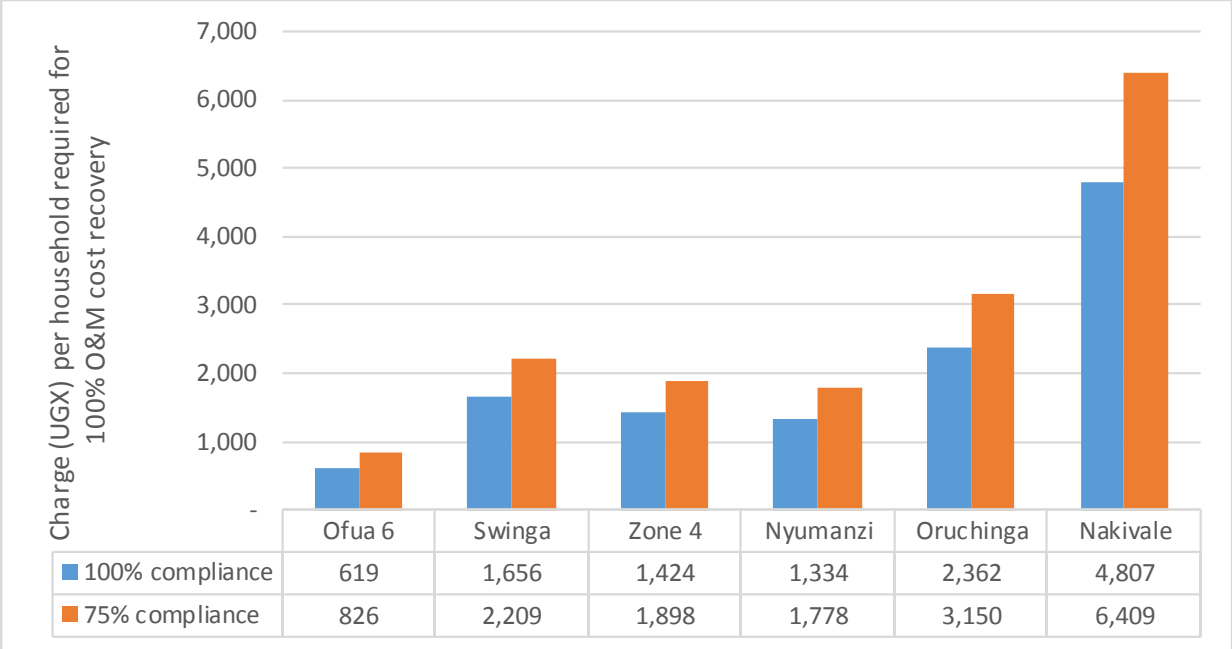
The most notable conclusion from the engineering assessment of the O&M costs of water supply in the six sites of focus is that costs vary dramatically, as shown in Table 16. The lowest costs are seen in Ofua 6 settlement, which has estimated costs of UGX279/m3 of water; this increases to as a high as 17,390/m3 in Nakivale. Where legitimate comparisons with previous costing estimates can be undertaken (i.e. where similar technologies are identified across the different studies), there appears to be broad comparability between these results and earlier studies, specifically the Bassi et al (2018) study, although our engineering estimate suggests costs that are typically slightly lower than in this earlier study (Andreasi Bassi, et al., 2018).

*Table 16 Key information on O&M costs at different sites*

| Settlement | Ofua 6 | Swinga | Zone 4 | Nyumanzi | Oruchinga | Nakivale |
|---|---|---|---|---|---|---|
| **Technology** | Borehole with solar-powered pump[64] | Borehole with hybrid pump[65] | Borehole with hybrid pump | Multiple boreholes with hybrid pumps | Two boreholes with solar-powered pumps & iron removal equipment | Piped water system from Lake Nakivale |
| **# of households** | 7,070 | 8,473 | 6,259 | 7,800 | 1,825 | 28,904 |
| **Monthly water delivery, m3** | 12,000 | 12,480 | 8,970 | 3,270 | 3,630 | 4,320 |
| **Monthly cost per m3 (UGX)** | 279 | 477 | 475 | 1,495 | 978 | 17,390 |
| **Monthly cost per m3 (UGX), Bassi et al. estimates** | 340[66] | 592[67] | 915[68] | 1,240[69] | 1,272[70] | |

This variance in costs leads to a similar variability in the per household charge that it is estimated would need to be charged to ensure full O&M cost recovery: this varies between UGX 619-4807 assuming that all households contribute to cost recovery and UGX 826-6409 if only 75% of households contribute to cost recovery. The lowest required tariffs are always in Ofua 6 and the highest are always in Nakivale. This is shown in Figure 22.

[64] WB document says delivery is made by trucks, contrary to what is said in the field visit report
[65] WB document says there are 25 boreholes; field visit report implies there is just one
[66] Based on a 50m3/hr solar system; Ofua 6 is 72m3/hr solar system
[67] Based on a 50m3/hr hybrid system; Swinga is a 40m3/hr hybrid system
[68] Based on a 25m3/hr hybrid system; Zone 4 is a 23m3/hr hybrid system
[69] Based on a 5m3/hr hybrid system; Nyumanzi is a 2-3.6m3/hr hybrid system
[70] Based on a 10m3/hr solar system; Oruchinga is a 4-10 m3/hr solar system




| | Ofua 6 | Swinga | Zone 4 | Nyumanzi | Oruchinga | Nakivale |
|---|---|---|---|---|---|---|
| 100% compliance | 619 | 1,656 | 1,424 | 1,334 | 2,362 | 4,807 |
| 75% compliance | 826 | 2,209 | 1,898 | 1,778 | 3,150 | 6,409 |

*Figure 22 Household charges needed for full O&M cost recovery in the different sites*

A number of factors account for these differences in costs/household tariffs needed for cost recovery:

- Differences in technology. Most notably, in Nakivale, water is suctioned from a nearby lake, rather than provided by boreholes/wells dug into the ground. This process is much more energy-intensive and requires *much* more chlorine (450kg per month vs. 15-45kg), as well as additional chemicals (alum and soda ash) on account of the high algae content of the lake (Field Report, pp. 37).
- There is evidence of economies of scale in the delivery of water. Costs per m3 are lowest in Ofua 6 and Swinga, both of which provide more than 12,000m3 per month, and higher in the settlements providing around 3,000 m3 per month (Nyumanzi and Oruchinga).
- Site-specific factors. For instance, chemical costs are higher at Oruchinga than others due to greater chlorine requirements (45kg vs. 15-25kg), while the number of staff and the amount that they are paid also varies by settlement.

The available evidence suggests that the variability in costs seen across these sites reflects the broader pattern across all Ugandan settlements, rather than just being a function of the small number of settlements in the sample. Although an imperfect measure of costs, it is possible, using data from UNHCR, to compare the household charge required for full O&M cost recovery in the six sites of focus with the same variable for a broader cross-section of settlements. As Figure 23 shows, the sites of focus appear to be drawn from across the spectrum.

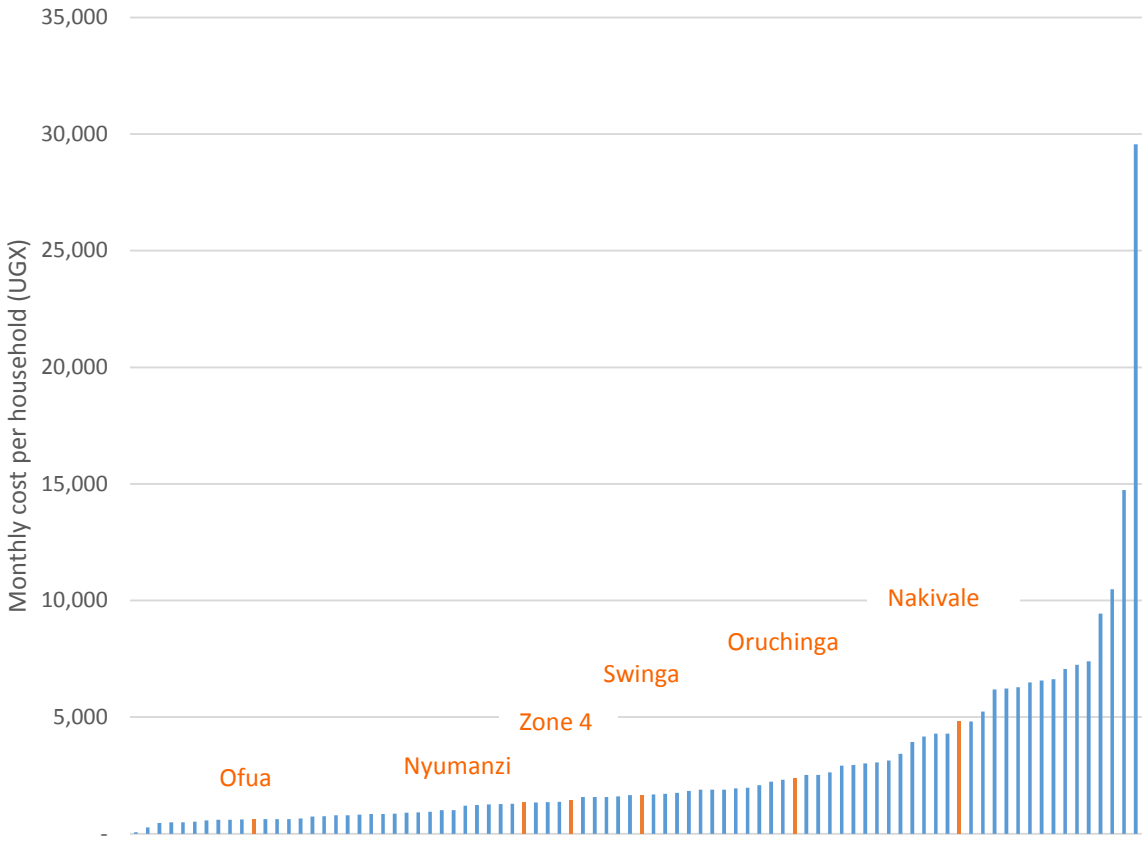



*Figure 23 Estimates of per household user charges needed for full O&M cost recovery across different Ugandan refugee settlements*

The finding that water supply costs vary substantially across different settlements, both those of focus in this study and more generally, has at least two important implications for water-use charging:

- Appropriate charging solutions and levels are likely to vary by settlements, not just for socio-economic reasons as explored in 4.5.1, but also because of substantial differences in cost.
- The substantial variability in costs raises the possibility that there may be scope for realising cost efficiencies. If achieved, these efficiencies could help to make user charging more appropriate, robust and sustainable across a wider number of settlements.

### 3.4.4 Combining information on costs, charges and ability to pay

This section combines information on costs and ability to pay, as proxied by reported income, household expenditure and access to savings, to gain additional insights into the feasibility of introducing (or increasing) water use charges across the six sites. As the analysis is drawn from a relatively small household survey it needs to be treated as indicative only.

Figure 24 compares self-reported median monthly income in each settlement with an estimate of what would need to be charged for full O&M cost recovery, assuming 100% payment rates. The settlements where there could be the greatest potential for water user charging are those where income levels are comparatively high, reducing affordability concerns, and also where costs are relatively low, such that a user charge could make a

substantial contribution to cost recovery. However, in the case of the sites of focus for this study, it is striking that water use charges have already been introduced in the settlements where reported median monthly income is comparatively high, while reported monthly income is substantially lower in the three settlements where there is no user charging at present.

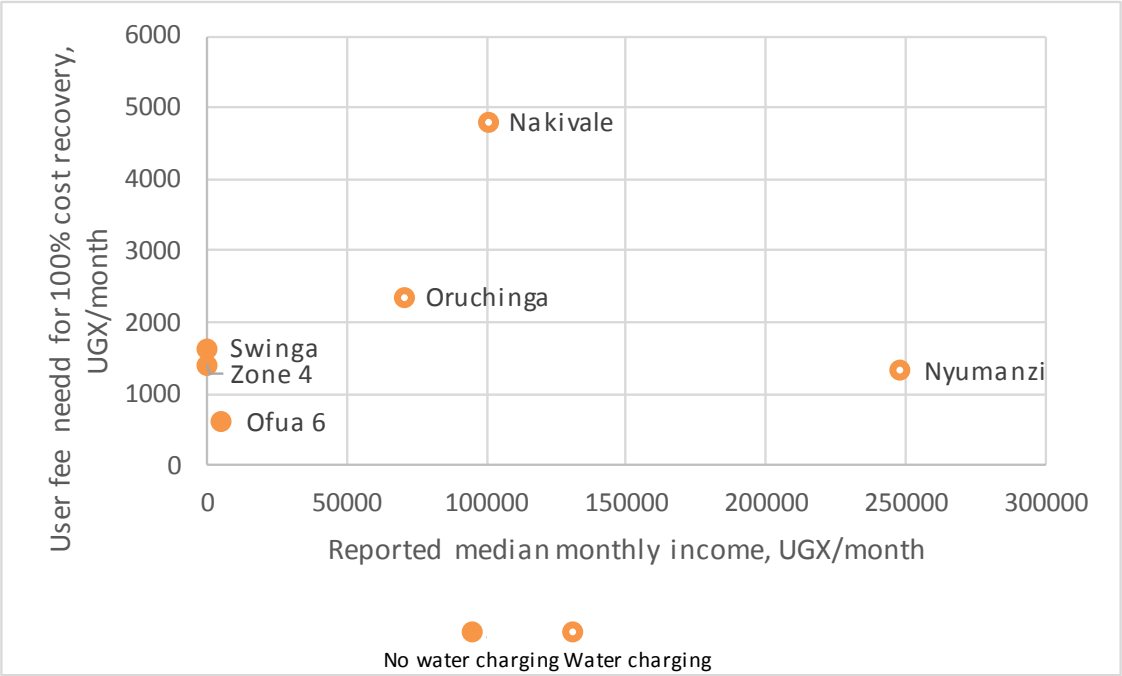



*Figure 24 Estimates of per household user charges needed for full O&M cost recovery across different Ugandan settlements*

The above analysis only considers the median reported income in each settlement. Further insight on potential pricing options can be obtained by looking at the distribution of income reported in the household survey for each settlement, and taking account of the suggestion that water charging might be unaffordable if it constitutes more than 3 – 5% of household income (Damme, et al., 1984) (Mcphail & Bank, 1993) (Saunders & Warford, 1976). Using this ratio as a guide for affordability, the table below considers the additional revenue that might be available, as a percentage of the revenue shortfall required to cover O&M costs[71], under three different 'decision-rules' for determining which households should pay how much:

- All households pay 3% of their household income for water use (inclusive of any water use charges they already pay)
- Recognising that it is likely to be very difficult to perfectly price discriminate between households according to their income, and that it might be inappropriate for households on very low incomes to pay 3% of that income for water, a second decision rule is that all households that have household incomes above the median might pay a water use charge equivalent to 3% of median income in the settlement (inclusive of any water use charges they already pay)

[71] In settlements where there is already water user charging, the analysis assumes that any households for which the existing water charge (UGX 1000/month) would constitute more than 3% of their household income are not currently paying a water use charge.

- A variant of the second decision rule considers that all households with household income that is about the 75th centile, pay water use charges equivalent to 3% of the household income of the income of the 75th centile household. Compared to the second decision rule, this approach places the burden of water use charging on the most affluent households in the settlement,

*Table 17 Percentage of revenue shortfall that might be realized while recognizing affordability constraints in different sites**

| Settlement | Decision rule 1: all households pay 3% of household income for water | Decision rule 2: all households that have household incomes above the median pay a water use charge equivalent to 3% of median income in the site | Decision rule 3: all households that have household incomes above the 75th centile in the site pay a water use charge equivalent to 3% of the 75th centile income level in the site |
|---|---|---|---|
| **Ofua 6** | 72% | 13% | 32% |
| **Swinga** | 24% | 0% | 9% |
| **Zone 4** | 46% | 0% | 7% |
| **Nyumanzi** | 1147% | 746% | 501% |
| **Oruchinga** | 611% | 15% | 66% |
| **Nakivale** | 99% | 27% | 45% |

**Note: the percentages in this table refer to the proportion of the funding gap that is closed by applying that rule i.e. for Ofua 6, applying decision rule 1 would raise 72% of the additional revenue that in needed to ensure that all O&M costs are recovered*.

While these results should be treated with caution in light of the limited sample of households in the survey in each site, a number of insights can be taken from the table:

- Taking account of affordability constraints, there appears to be greater scope to further raise water user charges in settlements that already have water use charges, than to introduce them in the settlements that do not have charges at present. Setting a water use charge equal to 3% of median income and asking those with income levels above the median income to pay this, would imply additional user charges of UGX 6440 in Nyumanzi, UGX 500 in Oruchinga, and UGX 2000 in Nakivale. These higher water use charges would be easily sufficient to cover O&M costs in Nyumanzi and would close 15-27% of the estimated funding gap in the other two sites (taking estimated total O&M recovery to around 40% in both sites). It is striking that the willingness to pay (more) for water in also much higher in these three settlements than in the settlements where there is no water charging at present.
- Among the settlements where there is not water user charging, affordability constraints are slightly less significant in Ofua 6 than Swinga and Zone 4 where, if the household survey results are corroborated by other sources, affordability constraints could act as a substantial barrier to water use charging.

In most settlements, asking the more affluent to pay higher water use charges (decision rule 3) appears to raise more revenue than asking a greater proportion of households to pay a lower user charge (except in Nyumanzi). This likely reflects the skewed distribution of incomes within the settlements. The extent to which it is possible to means test in this way has yet to be determined.

The table below provides an indication of the user charge implications of the various scenarios under consideration regarding the transition of operation of refugee water supply schemes. This analysis and the charges it defines are based on average water consumption and potential cost recovery tariffs for refugee systems. These values are **indicative only** and serve to test the affordability of water supply schemes for refugees under different operational models. Scenario 1 shows the per household monthly charge to cover O&M of the water supply system in each settlement. Scenario 2 considers the affordability constraints analysis above and places the shared O&M coverage charge on only the wealthiest 75% of households in the refugee settlements, i.e. excluding the 25% of households that are most vulnerable or earning below the affordability threshold. Scenario 3 demonstrates the impact of a transition to volumetric charging if the systems were taken over by the UA. Average water consumption by refugee households was determined in the illustrative household survey and used to understand possible monthly water bills under volumetric charging.[72] Fees in UA-managed systems are set specific to the scheme, considering operational cost recovery and affordability in the recipient communities. The charges shown in scenario 3 are **indicative only**, based on the cost per cubic meter to deliver water in each settlement.[73] Scenario 4 shows the use charge implications if refugees pay the universal pro-poor rate charged by the NWSC.

*Table 18 A comparison of charges in the operational transition scenarios under consideration for refugee settlements in Uganda**

| Charge Scenario | | | Ofua 6 | Swinga | Zone 4 | Nyumanzi | Oruchinga | Nakivale |
|---|---|---|---|---|---|---|---|---|
| **1** | **O&M monthly cost per household** (UGX, all households pay) | | 619 | 1656 | 1424 | 1334 | 2362 | 4807 |
| **2** | **O&M monthly cost per household** (UGX, only 75% of households pay, excluding the most vulnerable) | | 826 | 2209 | 1898 | 1778 | 3150 | 6409 |
| **3** | **Possible Umbrella Authority Tariff and Charges (volumetric)** | O&M Monthly cost per m3 (UGX) | 279 | 477 | 475 | 1495 | 978 | 17,390 |
| | | O&M Monthly cost per household (UGX, based on average water use in refugee households) | 1153 | 2352 | 2336 | 5890 | 4061 | 42372 |
| **4** | **Likely NWSC Tariff and charges (volumetric)** | NWSC pro-poor tariff per m3 (UGX) | 1060 | | | | | |
| | | Potential average monthly NWSC charge per household (@pro-poor tariff) | 4379 | 5227 | 5214 | 4176 | 4401 | 2583 |

*Note: grey shaded rows indicate possible monthly bill values while white shaded rows indicate potential or existing tariffs.

[72] Given the small size of the household survey, the average household water consumption should be taken as an indicative input only. Thorough water demand assessment should be for each system to improve this estimate.

[73] It should also be noted that these charges do not reflect any mark up for profit by the UA and in reality, these charges may be higher.

Considering these cost implications to potential refugee customers, it would be necessary for the ownership transition of refugee water supply schemes to be implanted in a way that keeps costs to the refugees as low as possible. A monthly fixed charge that shares the O&M cost coverage requirements across all households receiving water remains the most affordable option for all settlements (except Nakivale). This should be considered the preferred method of charging in the short term while systems are in the transition phase to NWSC or UA operation. In the medium to long term, the allocation of refugee settlements between UA or NWSC operation should be determined by the ultimate user charge to the customers. Based on the above analysis, it appears that the systems in Ofua 6, Swinga, Zone 4 and Oruchinga are most affordable to customers when managed by an UA. The Nakivale and Nyumazi systems would be most affordable when managed by NWSC.

Ultimately the tariffs and charges set by the NWSC or the UA would need to consider good practice and be highly aware of affordability constraints specific to each scheme. User fee charging should be implemented in an equitable way.

**Textbox 11: Good practices in terms of user fees**

**Refugee community setting their own tariff in Nyumanzi.** Being given the opportunity to set their own user fee, the refugees in Nyumanzi were able to come up with a user fee that would cover small repair, but that they could afford. This method has proven successful since the refugees have been paying for water for the last two years. The fact that the money is collected and kept by the refugees and not handed to LWF allows the refugees greater confidence and assurance that the money will only be used for the O&M of the scheme for the good of their community.

**Growing acceptance for water user fees in Oruchinga.** Our community interviews have shown that beneficiaries – both refugees and host communities – are relatively open to contributing to O&M expenses through water user fees. This sentiment of acceptance has grown over the last few months, Nsamizi reported.

### 3.4.5 Conclusions: Introducing a user fee in refugee water supply schemes

As communicated by the UNHCR, key stakeholders have agreed that user fees will be implemented in refugee settlements, without agreeing on a specific timeline (UNHCR KII, June 2019). However, contextual differences between settlements, in terms of their maturity, length of stay, stability amongst others, should also be carefully considered to when implementing this user fee. The main conclusions that arise from the economic analysis of water supply costs, ability to pay and willingness to pay, and hence the possibility for (higher) water use charges, are that:

- **Water user charges and user satisfaction is positively correlated**: Households in settlements where there is already some water use charging are generally more satisfied with the quality of their water supply than households in settlements where water is provided for free.

- **There is considerable diversity in the operational costs of water supply across different settlements**, some of which is driven by economies of scale, but some of which reflects technological and other factors that imply some settlements supply water more efficiently than others
- **In light of affordability considerations, there may be more scope, in the immediate term, to increase user fees to levels that improve cost recovery in the settlements where there is already water use charging (Nyumanzi, Oruchinga and Nakivale) than to introduce user charges in settlements where there is currently no user fees**. Specifically, the preliminary evidence suggests it might be possible to ensure full O&M cost recovery in Nyumanzi by raising user fees by around UGX 800-900 per household (for those with above median income), and to move towards 40% cost recovery in Oruchinga and Nakivale by increasing user fees by UGX 500 – UGX 2000 (for those with above median income). These user fee increases are more affordable for more affluent households. Among the other settlements, there seems to be slightly more scope to introduce water use charging in Ofua 6 than Swinga and Zone 4, but in all three settlements affordability constraints, and the implications of water use charging for the vulnerability of refugees, could restrict charging in the short term.
- **Affordability constraints and equity considerations should be carefully assessed prior to 'gazetting' refugee water supply systems, and specific choices should be made to maximise welfare when allocating systems between the NWSC or the UAs for operation**. Before initiating a user fee in any refugee settlement, a thorough affordability and equity assessment exercise should be undertaken. The universal pro-poor tariff at the NWSC improves the cost burden to the customer in Nyumanzi and Nakivale. Conversely the scheme-specific and cost-based tariff setting practices of the UAs may ensure that the cost burden at Ofua 6, Zone 4, Swinga and Oruchinga is lower for refugees. As yet, there is no clear criteria determining gazetting and allocation of water supply schemes between NWSC and the UAs. This study recommends that for refugee water supply systems, **the ultimate affordability of the water charges that would be imposed under the institutional options should be the primary consideration for allocation (alongside institutional and geographical considerations for allocation).**

From these conclusions, we propose a number of short- and long-term recommendations for further analysis, which feed into a longer-term vision for how water user charging might evolve across the settlements.

The below figure provides an overall vision for the gradual approach to water charging policy in refugee settlements in Uganda, a preliminary assessment of where the different settlements of focus in this study are along this continuum, along with the policy framework and associated analysis that will be required to implement this vision. In the middle of the chart is the gradual approach: suggesting that settlement might move from no water charging, to lower levels of water charging on a per household basis, to higher levels of per household charges (possibly with more price discrimination) to integration into the national system for water management (either the NSWC or one of the six UAs) and a parallel shift to volumetric charging. However, to implement this approach robustly, a policy and analytical framework needs to be in place. The aspects of this framework that have been covered partially in this study are shown by the hatched shading. Progress toward this end (as at the extreme right of the diagram) is not yet visible and remains a long-term goal in Uganda.

Specifically looking at the water sector, the gradual approach would require a regular assessment of household income and broader assessment of vulnerability to ensure that (higher) water charges would not have adverse impacts. This regular assessment should be accompanied by awareness campaigns that emphasize the need and importance of paying for water (and other services) as part of building more self-reliant refugee communities. There would need to be specific attention at the point in which the integration of settlements into the national system for water management is being contemplated, to understand the potential impacts of the shift to a volumetric charging structure based on detailed water demand estimation. In addition, regular engineering assessments of possible ways of securing efficiencies in water delivery, would reduce concerns about affordability. However, the issue of water charging should not be considered in isolation but rather as part of a broader shift to self-reliance by refugees.

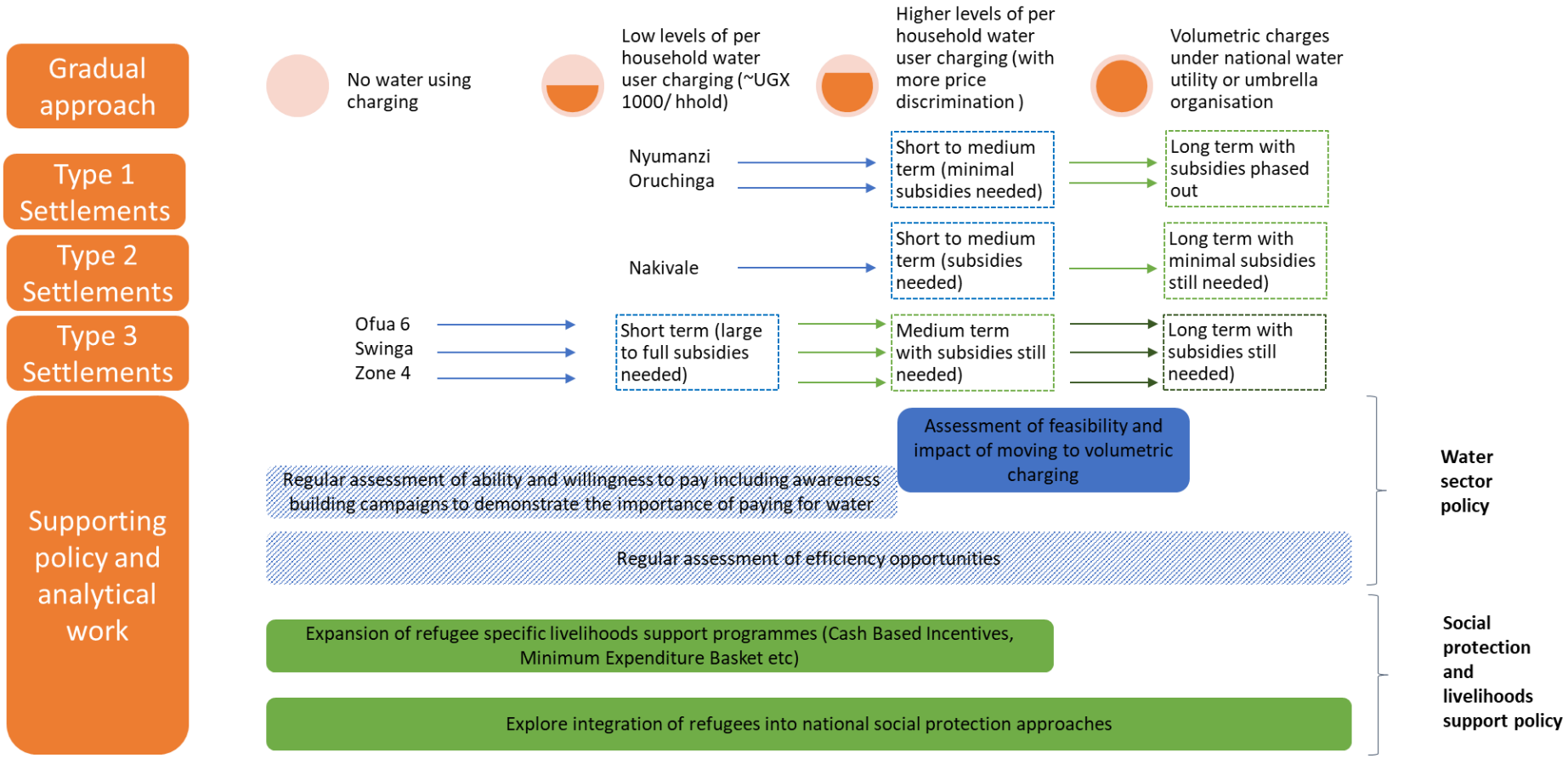



*Figure 25 Proposed roadmap for water use charging*

### Short term: gradual introduction of user fees and associated subsidies in refugee settlements

At present, Ofua 6, Swinga and Zone 4 currently have no water charging but the preliminary analysis of this study suggests there may be some scope for the introduction of a **modest fee** in Ofua 6. Nyumanza, Oruchinga and Nakivale currently have low levels of user fee, but there appears to be scope to increase these to move closer to cost reflectivity, especially in Nyumanzi.

In the short term, it would be desirable to undertake a more robust household survey, especially in the settlements of focus, to acquire a more comprehensive assessment of both ability and willingness to pay. The survey would have more respondents from each site considered in order to provide greater confidence around the statistical validity of the results.[74] Assuming that these survey results corroborate the findings of this report, it would also be necessary to investigate the feasibility and robustness of different approaches to means-testing/price discrimination in the settlements.[75] These further research needs would be critical to corroborate the analysis in this report suggests that, in many settlements, more revenue can be raised (and hence greater contributions towards financial sustainability can be achieved) from having higher, but still affordable, charges levied on a smaller proportion of households rather than levying smaller increase in user charges across a wider spread of households. However, this sort of approach would require that there were socially (and potentially technologically) robust approaches to achieve this price discrimination. This needs to be tested before a decision is reached on how the burden of any increase in user charges in settlements is allocated across different households within that settlement.

The results of these analyses could then be used to both confirm, and further detail the classification of settlements in such a way as to facilitate a) the introduction of, higher user charges within settlements where affordability constraints are least binding (Nyumanzi, Oruchinga and Nakivale), in a manner that reflects the distribution of income within those settlements, and b) strategise the longer term efforts needed to enable the introduction of water use charging in remaining settlements. This is an important exercise to be done in the short term that assists in the defining the approach moving forward.

The analysis completed thus far identifies the following classification:

1. The ability to pay in the settlement is high and the majority of households are able to start paying a cost recovery user fee in the short term. Despite higher ability to pay, it would remain preferable to place the burden of the user-fee on more affluent households who may then cross-subsidize more vulnerable households. Nyumanzi and Oruchinga fit this classification.

[74] However, it should also use more sophisticated techniques than was feasible in this study in order to obtain information on ability and willingness to pay. For example, on income and consumption levels (ability to pay), multiple visits to households could be undertaken, and further questions could be considered to ensure that all sources of income across all household members are taken into account. Statistical adjustments to account for discrepancies between reported income and reported consumption may also be desirable. In terms of measuring willingness to pay, a variety of elicitation approaches could be adopted (open-ended or closed, with or without scenario description) and could be adopted through split-samples, to gain a more robust understanding of this crucial variable.

[75]

2. There is an ability to pay in most households but there is not the ability to cross-subsidize poorer households. In this case, we suggest external subsidies in the short term for the population that cannot otherwise pay. With time and targeted support at livelihoods development for refugees the aim would be to transition to a type 1 settlement. Nakivale fits this type, mostly due to the high O&M requirement for this system.
3. The great majority cannot afford user fees – a camp-wide user fee subsidy should be envisaged. Hopefully with ongoing support, economic development and continual improvement in the efficiency of the water supply system these settlements can move to Type 2 and 3 classification. Ofua 6, Swinga, and Zone 4 fall within this category.

Subsidies may come from partners, but also other humanitarian actors operating in the country. NGO partners are positioning and pitching to both humanitarian and development donors as providers of transition support (technical and financial) to the emerging operational context (protection mandate) (Githiri, April 2019).

**Textbox 12: Short term: Transition arrangements by NGO's and direct payment of water bills by UNHCR/Partners** (Githiri, April 2019).

- In contexts where utility approach can be applied immediately such as Rwamwanja, UNHCR and partners to collaboratively contribute to payment of bills for refugee to access water services. A pro-poor tariff to be negotiated and agreed upon (the NWSC pro-poor tariff is universal while the UAs will establish scheme-specific pro-poor tariffs). It is recommended to investigate the adoption of digital technologies for dispensing water to consumers for ease of monitoring consumption patterns and backing up the expenditures/bills.
- In alternative contexts, transition arrangements to be put in place to prepare refugees and hosting populations for eventual change in modalities of service delivery. Formation of 'Water Boards' similar to the approach in Oruchinga settlement, which gives refugees and hosting population a considerable role in service delivery is recommended. This has already started in Arua (West Nile) and Nakivale settlement.

Across all settlements, the most effective way to reduce the risks associated with water use charging is to ensure that all households within the settlements have high enough levels of income and are adequately engaged in the process of introducing fees. If this is achieved, there is also less risk that interventions related to improving the sustainability of the water sector do not have negative implications for the access to, and financing of, other essential services such as nutrition or education. Therefore, in addition to exploring the scope for higher water user charges in refugee settlements, it would also be valuable to consider models by which refugees could be integrated into the planned expansion of Uganda's social protection policy, especially cash or voucher-based support programmes[76]. The NWSC also has experience administering water vouchers in a similar process to the

[76] In particular, the Ugandan policy on Social Protection states that: "Although Government has made commendable progress in reducing poverty, a significant proportion of the population still face high levels of risks and vulnerabilities due to their socioeconomic status. In particular, persons with severe disabilities, older persons and members of households with limited labour capacity constitute the most vulnerable groups of the population. These vulnerable groups have inadequate capacity to take advantage of existing economic opportunities and therefore face enormous challenges to maintain a minimum acceptable level of consumption. In order to ensure that these groups live in dignity Government shall scale up existing direct income support interventions and design new programmes to cater for other groups in need."

food vouchers which the refugees are familiar with. This could build on plans, for example, in Kenya, where there are plans to make the existing Hunger Safety Net and Social Protection system extend to refugees in Turkana using cash-based and basket instruments.

The **Minimum Expenditure Basked (MEB)** is a basic services support mechanism that includes water and is an avenue to provide cash to households to provide water services. MEBs can assist organizations that respond with **cash-based transfers (CBT)** to meet basic needs. According to the World Food Programme (2018), the MEB can help to achieve the following:

- support decisions on transfer value amounts for food and non-food needs, including supporting multi-sector coordination (government, partners and donors);
- support population profiling, and in some cases targeting, for multi-sector/multipurpose cash interventions by identifying the characteristics of those who cannot meet their essential needs;
- inform decisions on which goods and services to assess in a supply assessment;
- monitor immediate and longer-term food security and resilience outcomes by analysing expenditure trends relative to the MEB; and
- establish a relevant basket against which to monitor market prices and the cost of living.

However, MEBs excludes support to hosting populations and can potentially poison asylum space" (Githiri, April 2019).

**Longer-term: transition to utility management, multiplication of cross-subsidies**

In the longer term, especially in settlements where user charging is not yet feasible due to affordability/vulnerability constraints, there is a need to continue to upscale and improve the effectiveness of livelihoods support programmes. This can provide the basis for income generating activities that will allow for the introduction of water user charging in a sustainable way.[77] A regular assessment of household income and other factors determining vulnerability will allow for the graduation of settlements from no water charging to low amounts and then progressively higher amounts.

There is also scope for further evolution in the approach to water user charging in more affluent settlements where there is already charging. While this study identifies that there is a short term opportunity to increase the per household user charge in these settlements, in the longer-term sustainability is only likely to be achieved if the provision of water is integrated into the national approach for organising water supply and water charging – either the NSWC or one of the six UAs. This would require a shift from charging on a per household basis to a volumetric charging. While this is ultimately desirable, the implications of any such move needs to be carefully assessed. In particular, the risk that such a transition could lead to unsustainable water consumption in specific households, should be considered and demand management instruments be applied. Of the settlements

[77] The survey results indicate that the precise way to do this best may vary across settlements. For example, in Ofua 6, refugees may need support to better exploit existing access to land and markets, along with scaled up access to cash-based incentives. By contrast, in Nyumanzi, there is already heavy reliance on cash-based incentives and focus may be directed towards scaling up livelihoods' activities.

reviewed in this study there appears greatest scope for Nyumanzi to undertake this transition in the near term. The following actions have been suggested to establish an enabling environment for such a transition (Githiri, April 2019):

- Engage development partners and the government to consider direct budgetary support for provision of water services to refugee hosting areas. This can be structured alongside pro-poor subsidies, which is normally applied for 'marginalized populations' or economically disadvantaged in the society.
- NWSC and UAs to receive the subsidies through the MWE and pass them on to refugees and hosting populations through low value tariffs commensurate with 'ability to pay'.
- Stakeholders (UNHCR, OPM, MWE, local governments, etc) to negotiate a tariff acceptable to refugees and hosting populations, based on level of vulnerability. This will guide in establishing the level of direct budgetary support required to meet minimum standards of service delivery.

The transition described in this analysis will require new thinking about funding livelihood support, capacity building and basic services for refugees. The refugee response in Uganda may benefit from integrating these measures into its processes where there is a potential benefit. The instruments below are discussed briefly in terms of their concept and potential pros or cons.

The **'host-incentivising development impact bond'** instrument is designed to incentivise current or potential host countries to host refugees, with financing conditional on the achievement of pre-agreed results/impact of hosting policies or programmes. As a development impact bond, this instrument is set up to attract upfront capital from investors for the delivery of a programme by an implementing organisation. The programme results are assessed against specific, pre-determined measures of success. If the required results have been achieved, the investors are repaid capital plus interest by the government (in the case of social impact bonds), or an aid agency (in the case of development impact bonds). If the programme has failed to achieve the required results, the investor receives no interest and loses part of the capital investment (UNDP, 2019). Recognising the potential benefits to countries hosting refugees, the instrument could include an attractive package of incentives and support for countries embracing refugees.

The transition phase between partner and utility-based models require be particularly important and will serve as a changeover phase to strengthen the capacity of the institutions and district offices in preparation to the next stage. During this time, more detailed socio-economic studies of refugee basic needs should be undertaken to design a just and equitable transition.

**Textbox 13: The Cross-Subsidization Issue**

The dynamics of cross-subsidization as a mechanism to support the financial sustainability of refugee water supply systems will need to be analysed in greater depth, when the allocation of supply schemes between the NWSC and UAs is clearer. There are numerous possible options/scenarios that could define cross-subsidization arrangements in the water supply systems studied in this report:

1. In settlements where there is a considerable income range and where there exists a portion of the refugee population with sufficient means, a tariff system could be established where higher earning users cross-subsidize lower income users (e.g. Nyumanzi/Oruchinga). As already stipulated, a throughout affordability assessment, coupled with a detailed operational and cashflow assessment, should be undertaken before such an arrangement is established.
2. In settlements that will be taken over by the NWSC, the profitable systems in urban centres that are under this institution's management may be a viable source of a cross-subsidization for refugee supply systems.
3. Lastly, the systems that will be taken over by UA management will need to be considered alongside other systems managed in the UAs region. Where profitable systems exist (perhaps in the urban nodes), these systems may provide a viable source for cross-subsidization.

Overall, the design of a cross-subsidization mechanism needs to consider holistic dynamics across the water supply service and be informed by detailed and specific financial analysis (including cashflow and financial risk assessment).

# 4 Challenges Hampering Efficient & Sustainable Water Supply Services in Refugee Settlements

*Our detailed assessment has revealed a series of challenges relating to water supply in refugee settlements. These challenges are grouped according to six categories: design and establishment challenges, user challenges, engineering challenges, O&M challenges, financial challenges and sustainability challenges.*

*There are multiple links between challenges; for example, establishment challenges are the root cause of many other challenges, in particular user challenges. Financial and O&M challenges are also closely intertwined, as financing O&M is a central yet highly complicated issue. Financial and O&M challenges create a large sustainability challenge, and user challenges affect willingness to pay and therefore financial and sustainability challenges.*

## 4.1 Upstream challenge: design and establishment of water systems in emergency situations

The present discussion of challenges starts with design and establishment challenges, as this set of challenges are the root cause of many other challenges that will be discussed in the following. The design and establishment challenges are large and touch on sensitive issues.

### 4.1.1 Emergency establishment & related challenges

When a neighbouring country to Uganda unravels into conflict or unrest, and refugee flows are moving towards Uganda, the UNHCR calls for assistance from partners. One or a few NGO(s) respond(s) to the assistance call, and offer their services, including in setting up water supply infrastructure. While the UNHCR provides guidelines, in such time of emergency, the UNHCR is unable to vet each project, and to ensure that a coherent overall approach is adopted in each settlement. New requirements to apply for permits from the MWE for drilling water sources in refugee contexts, and to share technical designs with District Water Office (DWO) and MWE national officials for approval should improve this process.

Further, it is difficult to establish sustainable infrastructure that will meet a growing demand due to future demand uncertainty, as it is impossible to forecast future refugee flows and the spread of refugee settlements. In addition, often water systems that are established are not financially sustainable without ongoing financial injections to support O&M. This is in part due to perceptions regarding the refugees' inability of refugees to pay for water services, thus limited consideration is given to the recovery of finances required to cover life-cycle costs. Establishing a rigorous O&M approach can therefore be highly challenging.

Another issue related to establishment is that users/beneficiaries are in most cases not consulted on the design and maintenance of water supply and sanitation services in refugee settlements, due to the urgent nature of establishing such services in rapidly growing settlements. This is problematic in terms of securing beneficiaries' buy-in and building their understanding of the technology adopted, which is important to the water scheme's long-term sustainability.

### 4.1.2 Fragmented design, inconsistency and a lack of integrated water system designs

Planning a harmonised approach across agencies is difficult in the midst of crisis, and the sense of urgency for water security often trumps longer-term sustainable planning. The lack of uniform planning also means that different agencies adopt different technologies, which can increase O&M challenges and related costs. The numerous aid agencies working in refugee settlements are given the autonomy to design water systems in a designated area. This leads to the fragmentation of water provision and hampers effective water services. This can also result in duplications. Collectively, these issues result in a lack of integrated water systems design.

The technology used in different refugee settlements varies, as their different water systems are set up and provided by different agencies. Systems requiring spare parts not readily available in Uganda are more likely to encounter delays in maintenance. The autonomy of each aid agency to design water systems in a designated area tends to fragment water provision in the settlements and hamper effective water services. The quality of the service (i.e. volume, reliance and water quality) also varies from settlement to settlement, as each system is reliant on available (ground) water and sustainable abstraction practices. Hence, some stakeholders call for the establishment of a master plan to increase coordinated water resource and infrastructure planning within and across the settlement(s) (The World Bank, 2018).

### 4.1.3 Demographic, climate, and development trends put pressure on Uganda's water resources

The above-mentioned establishment challenges are worsened by Uganda's natural characteristics. As described by the World Bank, although Uganda's per capita freshwater resource is among the highest in the world, lack of infrastructure, climate variability, and environmental degradation hamper the country's ability to meet water demands. This will be increasingly problematic as water use is expected to triple by 2035. The National Water Resources Assessment (2013) forecasts that about 75% of districts will experience high or extreme water stress by 2035. As a result of climate change, increased temperatures in the country might increase the aridity of the climate in some regions of Uganda (The World Bank, 2018). The consequences of water stress appear evident in certain settlements; for example, according to the Technical Working Group, in the Rhino settlement, where the land is dry, about 40% of the constructed sources were abandoned due to insufficient yield (The World Bank, 2018).

## 4.2 User challenges

User challenges are multiple, and result in significant consequences for the livelihoods, sanitation and health of refugee communities. Further, these user challenges breed general community dissatisfaction with water supply

services, which also impact the sustainability of water systems, as they impact users' willingness to pay for water services. Customers' satisfaction is further described under 3.6.1.

### 4.2.1 Inadequate water supply levels (below minimum standards)

The minimum standard for water is 20L/person/day. In the districts hosting refugees, **water demand far exceeds available water supply**. The poor location of boreholes, frequent pump breakdowns, and distribution challenges in scattered refugee zones compromise water service and supply. Below standard access to water is not only an issue in settlements; nation-wide, Uganda also faces challenges to improve water supply delivery and ensure water security, especially in small towns.[78]

Although gradually increasing, access to water in terms of the current average water supply per capita is still below standard, with on average 18 liters per person per day (WESRRP 2019). In some areas it is only **60% of the recommended minimum standards**, meaning refugees are living without adequate sanitation and safe water (Danish Refugee Council, 2018). In Bidibidi for example, water supply is typically 17l/p/d. (Nabide, 2018). In some settlements, though only marginally in the six sites of interest, the UNHCR relies on **water trucking**, a very expensive option, to meet the minimum water demands (The World Bank, 2018).

There seems to be an **oversubscribed number of users**, with up to 250 per tap, 500 per hand pump and 400 per well, according to Sphere, which is much higher than the expected service levels in rural areas and rural growth centre and village[79] (Brown & van den Broek, 2018).

### 4.2.2 Low reliability: Intermittent water supply and inadequacy of energy sources

During the community group interviews, refugees reported that there are **issues with the time schedule of water availability** at the water taps. The taps are open by the water provider or water committee for a period that does not allow them to fetch enough water. This was confirmed in our household survey, 47.1 % of households experienced water shortages in the recent past (3 weeks).

Furthermore, **inadequate and often intermittent water supply** resulting from frequent infrastructure malfunction or breakdowns (pipe bursts, mechanical failures, and delayed repairs), energy source limitations (solar energy depending on luminosity) and inadequate storage at both scheme and household levels negatively impacts water security for the refugees and their host communities.

[78] National water supply coverage levels (77% in urban areas and 67% in rural areas) mask disparities in service quality between urban and small towns/rural areas. While in urban areas, 48% of households use piped water, it is only 33 percent in small towns and 9% in rural areas. Most of the country relies on community point sources. (The World Bank, 2018)

[79] According to Ministry of Water and Environment, expected service levels in rural areas are 300 users per shallow well or borehole. However, in refugee settlements, especially in emergency settings, the number of users is much higher (Brown & van den Broek, 2018). Rural areas as defined here comprise rural growth centres (500 to 5,000 users) and villages (under 500 users) (GoU, 2007)

### 4.2.3 Poor access to the water point, in particular vulnerable groups

#### Distance to the water point

The analysis suggests that the characteristic main sources of water for household reached across the six water schemes investigated are public standpipes and borehole water sources (at an average of 59% and 39.7% respectively). While there were no taps inside any of the households reached, 20.3% of households indicated a yard tap as the main source. The assessment also indicated that refugees travel fairly long distances – of up to 2 km on average – to fetch water, with each trip taking up to an hour (60minutes) on average. While distance is a challenge experienced by all, it is particularly challenging for persons with disabilities (PWD) and elderly women.

*Table 19 Distance to the water point*

| Settlement | Distance (in metres): (Average and Maximum) | Time (in minutes): (Average and Maximum) |
|---|---|---|
| **Ofua** | Mean = 233 m; Max =1000m | Mean = 25 mins; Max = 190 mins |
| **Swinga** | Mean = 185 m; Max = 600m | Mean = 8 mins; Max = 40 mins |
| **Zone 4** | Mean = 285 m; Max =1000m | Mean = 10.97 mins; Max = 60 mins |
| **Nyumanzi** | Mean = 113 m; Max = 400m | Mean = 9.96 mins; Max = 30 mins |
| **Oruchinga** | Mean = 228 m; Max =1000m | Mean = 12.28 mins; Max = 60 mins |
| **Nakivale** | Mean = 328 m; Max =2000m | Mean = 16.29 mins; Max = 60 mins |

#### Compounding challenges for PWDs and the elderly

Concerns have also been raised regarding the exclusion (often unintended) of persons with disabilities/elderly. This poor access to water services leaves them vulnerable. While this was not explicitly mentioned among our sample of interviewed refugees, the literature mentions that, refugees have expressed they feel that people with different physical abilities or the elderly were disadvantaged as they tended to receive significantly less resources compared to younger, able-bodied residents in good health (Ciottone, 2016). In cases where no family member (caretaker) can assist persons with disabilities or elderly people, they suffer. To this end, it is reported that some NGOs are taking measures to counter this bias and help the most vulnerable people.[80]

Among the households interviewed in the six sites visited, there was an average of 17% (49 out of 295) of households with a person with a PWD. It was found that households with a PWD had a lower willingness to pay (WTP) for water, and that they actually paid less than other households. This is likely to be explained by the fact

[80] In settlements located in the Ayilo District of Northern Uganda, for example, the organization Caritas reports that programs have been designed to provide more assistance for building latrines to groups identified as vulnerable, such as older residents, disabled residents, and child-headed households.

that many households with PWD are exempted from paying user fee, as decided by the water committee or board.

### 4.2.4 Inadequate water storage

Inadequate storage, which is a challenge at both scheme and household level, means that households cannot store adequate water for all WASH needs within their household. In one case, it was reported that the household could only acquire one 20 litre jerrycan of water a day, making it impossible to meet the per capita demand of 20 litres per person per day.

Communities indicated having few water collection vessels (usually jerrycans), and that they were often in poor condition i.e. broken or leaking and often without lids, which made it difficult to collect and store enough water at home. This general lack of adequate water storage for collection and storage affects the quantity of available water at households; amongst other, this results in poor standards of hygiene and sanitation.

### 4.2.5 Inadequate hygiene and sanitation, and resulting health concerns

The inadequate supply of water is also accompanied with inadequate hygiene, as reported in all sites visited. Despite water and sanitation efforts in Uganda's refugee settlements, there are concerns that water supply alone does not guarantee optimal health conditions for residents. Inadequate and often intermittent water supply resulting from frequent infrastructure malfunction or breakdowns and inadequate storage at both scheme and household levels negatively impacts the hygiene and health of the refugees and their host communities. Water is critical to multiple needs (e.g. drinking) and tasks such as cooking, cleaning cloths, bathing and the latter is often deprioritized.

Also, there is often limited accuracy of health measurements in settlements settings (frequent under-reporting of deaths by humanitarian organizations) (Spiegel, et al., 2001) which affect the ability to assess the real impact of water service challenges on sanitation and hygiene.

### Public health vulnerabilities linked to poor state of WASH

Inadequate water supply impedes communities from being able to embrace much-needed good sanitation and hygiene practices. This negatively affects the most vulnerable including women, the elderly and especially children with cases of diarrhea occurring regularly within those communities.

Poor water quality and insufficient quantity, leading to inadequate hygiene can put lives at risk, by contributing to the spread of diseases. In refugee settlements, significant health risks such as those from water borne disease outbreaks can be associated with low sanitation coverage (given insufficient pit latrines and communal sanitation facilities) which in turn causes severe water pollution and related environmental and public health issues. Frequent occurrence of diarrhea and malaria were reported in settlements, with children highlighted as the most affected. In the worst cases, cholera can spread. This was evidenced during the recent cholera outbreak in southwest Uganda which killed at least 49 people (Danish Refugee Council, 2018).

There appears to be a clear linkage between these disease incidences and the poor state of water, sanitation and hygiene in many settlements. Therefore, even though village health teams with mobile clinics exist to address sanitation and health challenges, this support needs to go hand in hand with improved WASH infrastructure and services.

Diminishing access to cleaning agents for hygiene purposes such as soap, brushes and jerrycans to clean water points and latrines is a major hindrance to hygiene standards, in addition to other challenges such as poor interest in volunteering for such unpaid work and animals from host communities coming to drink water at water points leaving a mess.

### Dependence on pit latrines: health and environmental risks

For their sanitation needs, refugees in Ugandan settlements depend on pit latrines, and not the flush toilets. Not all households' yards are equipped with pit latrines, however most refugees reported that the distance to a usable latrine (own, neighbors' or public latrines) is within a reasonable distance (less than 100 meters).[81]

A significant challenge relating to pit latrines is that most latrines in the schemes investigated were not built for emptying, but instead closed when full. Filled pit latrines can be a factor for the spread of diseases such as cholera and typhoid through the contamination of groundwater.

As they cannot be empties, filled latrines need to be replaced by new one. As this is not an easy task, many households do not have latrines, and this contributes to the reported open defecation in the refugee communities. Open defecation is a problematic practice in terms of human dignity, which result in the increase

[81] 68.5% of refugees interviewed reported having access to latrines within 0-50m, and 24.7% within 50-100m.

of fly populations, and impact the risks of the spread of illnesses such chloral, typhoid, polio, intestinal worms and others.

### Fragility of tippy taps and resulting poor hygiene practices

There were extensive reports of **tippy taps being damaged** through exposure to harsh weather (cracked under harsh sun). As such, there was a general decline/indication of poor hygiene practices (no handwashing after using toilets), which was made worse by the inability to afford soap, as it was reported that soap was no longer being supplied through aid.

### Inadequate access to soap

A number of refugees interviewed expressed that the amount of soap given to them was not adequate. While men reported not having the financial means to buy soap, women, who receive soap as part of the aid package reported not satisfied by the amount received.

When asked about available soap in latrines, 47.8% of households reached reported there being no water and soap for handwashing at pit latrine facilities across all sites visited.[82]

*Table 20 Households reporting the lack of water and soap available for handwashing at toilet facilities*

| Settlement | Number | % (age) |
|---|---|---|
| Ofua | 26 | 55.3% |
| Swinga | 37 | 75.5% |
| Zone 4 | 37 | 75.5% |
| Oruchinga | 12 | 24.5% |
| Nakivale | 13 | 25% |
| Nyumanzi | 16 | 32.7% |

### Location and design of toilet facilities

The physical difficulty for PWD associated with collecting water located at some distance from homestead is compounded by the lack of special access considerations such as ramps from the households to water points. With regards to access to sanitation, the same challenge applies for PWDs who have to access pit latrines outside the household, with toilet facilities lacking features tailored to the needs of PWDs.

## 4.2.6 The overwhelming burden on women and girls to collect and manage water

By virtue of cultural norms upheld among these communities, there was an overwhelming indication that the burden of household chores including water related tasks within refugee communities rest heavily on women

[82] There is a significant differences between the settlements of Nyumanzi, Oruchinga and Nakivale and that of Ofua, Zone 4 and Swinga: 61.2%, 59.2% and 55.8% of households surveyed Nyumanzi, Oruchinga and Nakivale reposted that soap was always available for handwashing; Only 16.3%, 24.5% and 40.4% in Zone 4, Swinga and Ofua reported the same.

(and girls). 78% of interviewed households mentioned that women were responsible for fetching water, often with the help of their children, especially girls. The role of women in fetching water for the households was highlighted by both men and women in Nakivale settlement; while men consulted in Nyumanzi settlement indicated that their cultural beliefs restricted males from collecting water from the water point.

*Table 21 Responsibility for fetching water at household across six refugee sites*

| Settlement | %Women | %Girls | %Men | %Boys | %All |
|---|---|---|---|---|---|
| **Ofua** | 87.2% | 34.0% | 6.4% | 4.3% | 2.1% |
| **Swinga** | 77.6% | 34.7% | 2.0% | 12.2% | 0% |
| **Zone 4** | 93.9% | 10.2% | 4.1% | 6.1% | 2.0% |
| **Oruchinga** | 53.1% | 34.7% | 16.3% | 40.8% | 2.0% |
| **Nakivale** | 69.2% | 51.9% | 11.5% | 34.6% | 0% |
| **Nyumanzi** | 87.8% | 69.4% | 2.0% | 4.1% | 0% |
| **TOTAL** | **78.0%** | **39.3%** | **7.1%** | **17.3%** | **1.0%** |

The time spent by women to fetch water, up to 3-5 hours a day according to refugees interviewed, is a time that cannot be spent on other income generating or productive activities. Similarly, the time spent by women to fetch water impact time for recreational activities as well as supporting their children's education.

Furthermore, with the exception of Oruchinga and Ofua, our assessment across the six sites revealed a significantly higher percentage of female headed households at 64.4% (190) compared to 105 (35.6%) male headed households. This finding is significant noting that household chores, including fetching water and paying for the water services, already rests heavily on women within households, and becomes an even greater burden for those that are female headed and lack any support from male partners.

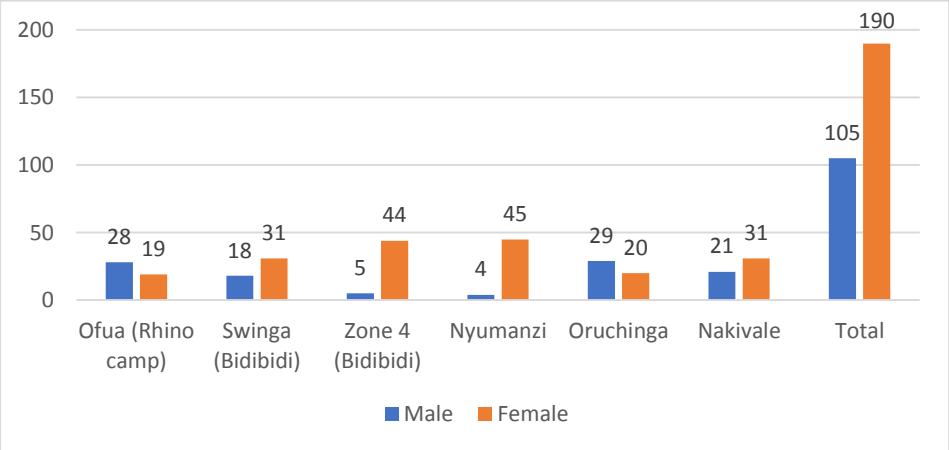



*Figure 26 Number of Household Heads by Gender*

It is important to recognise that within female refugee populations, further social dynamics and circumstances exist which impact and exacerbate the vulnerability of an individual differently. That is, the needs and challenges faced by females within a refugee community will differ for pregnant women, elderly women, widows, disabled women, girl-child headed households, and women and girls with chronic illnesses

#### Associated security risks

The water services provided by the schemes in the six investigated sites carry risks for communities. Firstly, water collection during late hours of the day, without adequate lighting is a challenge. In the six water schemes investigated, some water points were lit, whilst other were not. In both cases, there is no lighting along the paths leading from homes to those water points. The inadequacy of lighting along paths to water points exposes women and girls going to fetch water to various security risks. As noted above, sleeping at the water points can similarly expose women to risks, from men or wild animals.

#### User conflicts

Due to the limited amount of water supplied at the water point and the long queue, women have reported frequent disputes at the water point. Interestingly, our interviews and in the household survey, it appeared that relationship with the host was not a challenge. Conflict over water resources can be triggered between any user, either refugees or hosts.

While water-related conflicts are usually manageable, they might increase with time, as a knock-on effect from the current funding deficit; there is also a risk for the relationship between refugees and host communities to deteriorate. According to the UNHCR Uganda, “the lack of funding directly translates into more hardships for the refugees, more hardships to the host communities and more tensions” (Okiror, 2019).

## 4.3 Infrastructure challenges

While infrastructure in the six settlements are recent and in relatively good conditions, there are some infrastructure and engineering challenges, as highlighted below.

### 4.3.1 Low capacity utilisation rate and moderate system quality

As discussed under 3.3.3, the average capacity utilisation for the six systems investigated stands at 37%, which is very low compared to the capacity utilisation of NWSC regions of Kampala, Central, Easter and Northern and Western and Southern which stood at 93%, 65%, 43%, 67% respectively in 2017. Nakivale’s utilisation rate is the lowest of those six, with only 14%, followed by Nyumanzi (29%) and Ofua (35%). These rates are unsatisfactory. Nyumanzi and Ofua’s performance is also qualified as “fair”, and none of the six systems qualified as excellent.

### 4.3.2 Weak application of performance indicators, incomplete data capture and limited information sharing

Whereas performance indicators have become widely accepted in many water utilities around the world, their application in water systems for refugee settlements is still at infancy. For example, while water loss and non-revenue water are key indicators of the efficiency of water distribution systems, it is not considered by all partner agencies operating the systems. There are often disparities in how performance indicators are understood, used and then the degree to which compliance monitoring incentivises and supports improvements by water service utilities.

The weak application of performance indicators and the inadequate data capture observed in most visited settlements makes system performance monitoring a challenge. Further, most partners use their own performance evaluation and data capture systems, the lack of alignment makes comparison between systems very difficult. Due to a lack of clear guidance and diversity of mandate, some employees also seem not to understand the importance of monitoring and rather focus on water delivery and other operational activities with system performance seemingly not a priority (unless it is used as a conditionality for disbursement of resources).

In this regard, there could be argument for the introduction of an independent regulator that in the first instance supports utilities to develop aligned and standardised performance indicators, and then ensures that water services are provided in accordance with these indicators. This would be underpinned by improved and regular reporting regimes. This would support the governmental objectives of improving the sustainability and effective levels of service whilst also protecting the customer with regards to service standards and appropriate tariffing. Noting the institutional complexity that currently exists within Uganda, the introduction of a national water services regulator could prove valuable in supporting the MWE's drive to obtain better parity between refugee settlements and the host communities.

Further, it has proven difficult to access information on the existing infrastructure in settlements. Some data is not capture, and other not accessible. Knowledge seems to be "anchored" in specific individuals' memories, rather than captured at an institutional level in a transferable manner. This presents risks to the sustainability of the system when there is a lack of continuity, due to the turnover of knowledgeable staff, and the turnover of institution/partner in charge for water supply.

### 4.3.3 Inadequate system size and pressure on infrastructure

The projections of future refugee population in a certain region are very uncertain,[83] thereby making future water demand estimates challenging. There is no precise model to accurately predict refugee influx, nor predicting the length of their stay.

As discussed in section 4.1, in the infrastructure planning phase, too little attention is paid to population growth and associated water demand projections on which infrastructure designs could be based. Infrastructure in refugee settlements are installed by humanitarian partner on an ad hoc basis.

With high numbers of asylum-seekers and migrants arriving in Uganda each year, the pressure on natural resources including water, land and energy is increasing rapidly, with uncertainty as to what extent the infrastructure in place is adequate for this change.[84] As settlements develop into long-term homes, they often organically expand faster than spatial planning. Infrastructure is often not able to provide services in terms of this expansion. In many settlements, infrastructure is planned for a population which up grows, leading to a

[83] In is highly difficult or impossible to predict the evolution of the political situation, conflicts, etc. and therefore the flow of asylum seekers to come, especially in the medium and long term.
[84] On the other hand, it must be noted that some refugees are also returning home; the UNHCR does not track departure back to home country.

demand higher than the supply potential. For example, recently the design population of the refugee settlement in Kyaka II had doubled at the time of implementation in just three years when resources were being mobilised. This means that the demand had also doubled.

Water demand has been increasing significantly in our sample of sites. As a result, water supply infrastructure capacity to provide has been outstripped by current refugee numbers with adequate and reliable water supply, leading to user challenges discussed under 5.2. In Ofua and Swinga, more people are served than the tank capacity allows.

Moreover, as discussed in chapter 3.3.5, the capacity of tanks to supply current demand is not met in two settlements (Swinga and Nakivale); future demand will likely not be met in the same two systems, but also in Nyumanzi. Even with adequate system upgrades (larger tank, sufficient energy etc.), the water source would not have capacity to meet current demand in four settlements (Swinga, Nakivale, Nyumanzi, Zone 4); future demand would only be met in Ofua. Augmenting systems capability and extending existing systems to ensure adequate and reliable water supply will be a complex task.

**Textbox 14: Lack of predictability regarding the length of refugees' stay**

Predicting the future number of refugees is difficult. The challenge relates to impossibility to forecast socio-political factors in neighbouring countries. Further, it also relates to the preference of different individuals and communities (level of aversion to risk for example). Some communities might decide to remain in Uganda indefinitely, even if the political situation in their home country improves significantly; others might decide to return to their home country as soon as peace political stability or peace prospects are arising. In our field study, we observed that communities from Rwanda and Congo in the South of Uganda had a tendency to stay for the long term in Uganda, while the South Sudanese communities in the North would go back home (and potentially back and forth) as soon as there is hope for improvements in their home place. This is however just an observation and not a basis for robust prediction.

On the one hand, many Ugandans have shared their concern that refugees might return to their home country, leaving water systems underused or unutilised (abandoned). In this case, the concern is that local Ugandans are not allowed to settle in the refugee settlement to make full use of the infrastructure (they would be called "encroachers" and expulsed, as the space is to be kept for potential refugee inflow) (UNHCR S-W Key Informant Interview), leading to lost investments.[85]

## 4.4 O&M challenges

UNHCR partners are leading O&M efforts in refugee settlements; they do face a series of challenges, as highlighted below. Another O&M-related challenge concerns the need to secure the financial flow (through revenue or donation) to cover O&M costs; this will be discussed under the Financial Challenge section.

[85] This is what happened with IDP settlements too

### 4.4.1 O&M costs related challenges

The first challenge relating to O&M cost concerns the lack of asset management and O&M cost monitoring system in all visited refugee settlements. O&M costs were poorly documented. While no system was in place to provide clear data, O&M costs were estimated by breaking down maintenance costs. This lack of clarity over O&M costs complicated system's evaluation and is not conductive to sustainable approaches to O&M.

According to our estimates, O&M costs in the six investigated settlements varies significantly. This can be attributed to the variability in energy mix and to the water quality issues that require specific treatment regimes. The O&M costs in most systems are low, laying within 0.09-0.8 USD/$m^3$, because the majority of systems are solar powered. However, Nakivale's cost are very high, reaching 4.58 USD/$m^3$. This, again, does not include CapEx expenditure, which have been covered by partners. High O&M costs are challenging for the sustainability of any water supply systems, especially in an environment where donor funding and users' ability to pay are limited.

### 4.4.2 Delays in maintenance and repairs

In some camps visited, there were delays in the preparation of system malfunctions or breakdown. This is because there are no budgets readily available to fund the repairs. In addition, most of the resources disbursed by partners are skewed towards delivery of water. This delay can lead to severe complications. The temporary scarcity of water has led some families to go to bed hungry, as cooking without water can be a challenge. Further, and as mentioned previously in this report, refugees have reported that at times women sleep overnight at tap stands in order to stand in front of the queue at the waterpoint, to ensure that they would get access to water in the early morning.

### 4.4.3 Energy supply challenges

Many water systems are powered by solar energy; despite numerous advantages of solar systems, a disadvantage is its lack of reliability. Often, the systems are only functioning for a few hours a day (usually 6 to 8 hours maximum), thereby affecting water supply. Many refugees describe the intermittent functioning of the pumps as a challenge and called for "emergency" or complementary fuel-powered generators for overcast days.

## 4.5 Financial challenges

To establish and run water supply infrastructure effectively, there is an obvious need for funding. While securing initial investments, or investments to cover capital expenditure (CapEx),[86] can be a challenge, the most important challenge to consider in order to improve the sustainability of infrastructure is how to secure funding for operational expenditure (OpEx); in other words to ensure the on-going O&M of water infrastructure.

[86] In the future, the ability to fund CapEx investment for water infrastructure in refugee settlement is likely to decrease, due to the current funding gaps. preventing effective service delivery and leading to a deterioration in welfare of existing refugees but is also leaving Uganda seriously under-prepared for a major new refugee influx." This influx is significant; in the first half of 2019 for example, an average of 767 people came to seek asylum in Uganda every day (Danish Refugee Council, 2018).

As will be discussed under chapter 2 and 3, water infrastructure O&M is largely covered by UNHCR partners acting as WASH service providers in settlements. These partners are supported by donors. However, the budget allocated to refugees in Uganda seems to be shrinking. Less budget for refugees could cause disruptions to essential life-saving assistance for refugees, the UNHCR says; and, water provision is among the services most at risk, according to the UNHCR.

To ensure that O&M costs are covered to continue to provide water supply to refugees, there is a need for sustainable revenue collection from users. However, users' ability and willingness to pay is limited by insufficient opportunities for productive and income-generating activities, as will be discussed.

### 4.5.1 Shrinking budget to cover services to refugees in settlements

International humanitarian aid and government contribution are critical to providing basic services to refugees in settlements. However, none of those are unlimited flows.

#### Reductions in donor funding and humanitarian aid

There is a constant threat that funding from international donors will not be sufficient to meet refugees' needs. Other humanitarian crisis around the world have triggered refugee flows – people fleeing war and persecution in Myanmar, Syria, to name a few. The UNHCR has repeatedly faced difficulty to reach the yearly amount of donor funding it targets for the protection of refugees in Uganda. By 30 April 2019 for example, only 12% of UNHCR's financial requirements in 2019 were met by 30 April 2019. While the international community committed to supporting Uganda's Integrated Refugee Response Plan (RRP),[87] it is facing critical shortfalls (Danish Refugee Council, 2018). NGOs operating in the country often raise the alarm, as they did in 2018, when 25 international NGOs drafted a joint statement on the need for urgent action to address gaps in funding for the refugee response (Action Against Hunger, Adra, Care et al., 2018).

Further, recent scandals of corruption and financial mismanagement in the humanitarian aid sector in Uganda have further deterred donor's interest in providing funds to the country. A large part of humanitarian funding reaching refugees is channelled through the UNHCR, a donor funded agency. However, the agency is not sheltered from scandals. A November 2018 audit from the UN's Office of Internal Oversight Services revealed that UNHCR Uganda wasted tens of millions of dollars (between 1 July and 31 December 2017) for mismanaged operations, overpaying for goods and services and awarding contracts improperly. In the water sector, the audit reports "vast overspending". Major donors such as Great Britain and Germany have implemented an "aid freeze" contingent on the implementation of stringent integrity measures. For example, the British development agency, DFID, said it has not release funds to UNHCR in Uganda since the allegations of corruption emerged. (Okiror, 2019). While the UNHCR rapidly responded to the allegations, releasing a 2019 country response plan (Mbiyozo, 2019) to strengthen the organization's accountability, there are some concerns regarding funding in

[87] Commitments made in the 2016 New York Declaration and the subsequent Global Compact for Refugees

the months and years to come. It is unclear whether any – or how much – funding has been withdrawn to date,[88] but it is certain that bad press has been and will continue to be felt by development actors.

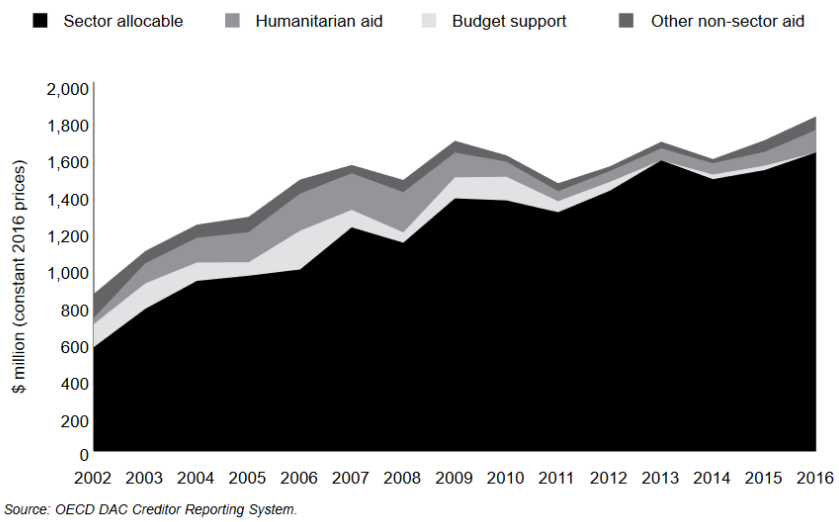



*Figure 27 Total ODA (minus debt relief) to Uganda (2002-2016)*

**The Government's financial constraints**

The government of Uganda is a major contributor to efforts to assist refugees. UNDP calculated that, in the financial year 2016/2017, the cost to Uganda of hosting refugees was at least USD 323 million, which equated to USD 277 per refugee (excluding the foregone revenue estimated at USD 45 million). The greatest cost incurred relates to refugees' use of firewood and water, calculated at USD 146 million (Poole, 2019).[89]

However, the government has limited resources available; the Ugandan population is growing rapidly, and the demand for public services is growing faster than the growth in tax revenues. The government thus faces growing fiscal constraints, and has borrowed money, which adds pressure to the public purse. Further, while it is a major development aid recipient, several donors have scaled back their aid to the Ugandan government, due to a series of political decisions and governmental actions, worsened by corruption scandals. According to Nunnenkamp et al., many donors have opted to switched from direct budget support to more circumscribed project-based aid. According to the Overseas Development Institute (ODI), budget support has fallen from 15% of total ODA excluding debt relief in 2002 to less than 3% annually in the five years (Poole, 2019).

### 4.5.2 Financial risk related to a shift to a utility model

The MWE and UNHCR decided that, in order to improve the sustainability of the water system, NWSC and UAs should take over UNHCR partners in managing water supply systems. However, the departure of NGOs from the field could come with a loss of the NGOs fundraising machinery in support of service delivery. Indeed, the

[88] According to ISSAfrica, no funding has officially been withdrawn to date, but US and the EU did threaten to do so. They are among the four biggest contributor to refugee support in Uganda (together with Britain and Germany), providing roughly 80% of 2017 funding (Mbiyozo , 2019).

[89] According to Poole, this UNDP study does not consider wider economic impacts, such as the effect of immigration on market prices, wages and employment.

consequences in terms of NGO partnerships and NGO financing of a shift from the current to utility system are unknown. NGOs attract funds by reporting on their achievements, and it is likely that subsidizing water user fees is less appealing to donors' hearts than financing the operation and maintenance of a water system. A major risk would be that significant financing coming through NGOs might dry off, without necessarily shifting to other sectors in the refugee operation, particularly funds from non-institutional sources. (Githiri, April 2019).

### 4.5.3 Lack of sustainable livelihood opportunities among refugees, reliance on development aid, and entitlement mentality

**Limited livelihood opportunities**

As highlighted by several surveys, including a recent country-wide vulnerability study, and verified during the field visit, livelihood opportunities in refugee settlements are limited. Income generating activities range from selling of food rations received, cultivating own parcels of land or land rented from hosts (in exchange for a portion of the produce), subsistence level vegetable gardening near water points, as well as trading in the local markets and mechanic work (especially for men - e.g. motorcycle repairs). Refugees across settlements mentioned receiving ad-hoc and therefore unsustainable sources of income.

Refugees also speak of a lack of financial resources to start small businesses. Being away from their homeland, refugees lack a network to support entrepreneurial projects. Further, the remoteness of settlement from cities is another impediment to stimulating economic activities. Constraints to undertaking income generating activities highlighted by refugees also relate to land issues. Despite the UNHCR policies on land, some refugees having received small plots to erect houses, but none for cultivation. Others claimed that the land previously granted to them for cultivation was taken away from them.

Another issue highlighted was the lack of skills training opportunities, in particular for adults.[90] The way of selecting participants for trainings – at times based on random selection rather than merit based – was also criticized by many refugees, who wish to develop income-generating activities through capacity development. The relevance of some trainings (e.g. in computer science) was also questioned by some refugees, who asserted that skills development efforts were not adapted to the context of the economy of refugee settlements and not conducive or fit-for-purpose for income-generating activities.

Some refugees also suffer from physical and psychological damage, which hamper their ability to work. While trauma support is available in some settlements, the stigma can persist.

**Entitlement culture among some individuals in certain settlements**

Some communities are highly dependent on aid and have not become independent/self-sustainable; that is the case of some communities in Bidibidi, and might be explained by the social background of the refugees, their experience in Uganda, or their intention to return in their home country when the political situation would allow. Many UNHCR and partners interviewed highlighted this culture of entitlement as a major hindrance to development. This is a challenge, as it not conducive to willingness to pay for water services.

**Limited time for women to engage in income generating activities**

In all refugee settlements visited, women were responsible for the time-consuming task of fetching water at the water point. As alluded to in 2.2.6, WASH related chores for women go beyond water collection, as they carry on into the household to include washing, cooking, cleaning, as well as child and elderly care should these be part of the household. In Ofua, the women reported having to cook first thing in the morning, and then look for work in the afternoon, in addition to collecting water (often waiting in queues at crowded water points, located far from the households, and often experiencing supply interruptions). Furthermore, it was women that were generally reported to being involved in voluntary cleaning of water points and sanitation facilities (latrines).

It is evident that a significant amount of time is spent by women on unpaid work daily. Where opportunities have been sought to participate in income generating activities (e.g. selling vegetables, and trading food rations), women stated that these are often inadequate nor compatible with household chores.

## 4.6 Institutional challenges

### 4.6.1 Institutional complexity and lack of coordination and synergies

The institutions playing a role in the provision of water in refugee settlements are varied, which created institutional complexity. As discussed under 1.3.1, key stakeholders include governmental and non-governmental actors, national and international actors, etc. These different stakeholders have different levels of capacity and follow different modus operandi which can create confusion and misalignment. Ensuring coordinated planning and implementation can therefore be difficult. There can be confusion in terms of the

[90] In multiple settlement, it was said that most training opportunities are targeting young people.

roles, responsibilities and accountability lines of different stakeholders, which can result in poor compliance monitoring.

There are also a high number of water supply and sanitation projects adopted by different actors throughout the country, and it is difficult to get a clear overview of all projects.[91] This lack of clarity is not conducive to inter-projects synergies.

As highlighted by the UNHCR, for years, refugee WASH coordination at national and district level existed outside the formal coordination structure of the MWE. Such "informal arrangement" was not conducive of cooperation and alignment between the various department and agencies involved in water supply in refugee settlements. Synergies between the refugee and water "worlds" were not optimised (UNHCR, 2019). In May 2019, the WESWG approved formation of Refugee Response Sub-Group, as described in introduction and under 3.1.1. This "anchoring" of the refugee response within the MWE and the Directorate of Water Development is hoped to improve coordination and synergies in this complex institutional architecture (UNHCR, 2019).

### 4.6.2 Lack of information sharing impedes coordination

There has been limited information sharing and knowledge exchange among the development partners and implementing agencies, and by the lack of standardised guidelines for WASH intervention in Uganda.

In most refugee settlements, water systems are managed by development/implementation partners who are often busy with a multiplicity of activities. These institutions are not all open about sharing information about their water systems and operations, which, according to some stakeholders interviewed, creates a silo mentality among the implementing partners which causes problems for O&M and sustainability. The several institutions (sponsored by different development partners) working in the same area do not always have regular communication nor formal protocol for information sharing. They do not always coordinate their planning activities.

While the UNHCR plays an important role, in most cases of large settlements, there is no single technical institution overseeing the performance and enforcement of integration in design of different systems. Hence, there is no institution responsible and able to make decisions for the whole system and to target system wide optimization of different parts of the water systems in refugee settlement.

[91] This includes: 1) Support to water and sanitation for refugees and host communities in northern Uganda- WSDF- N, 8mio Euro. Ongoing until 2021 covering the districts of Lamwo, Yumbe, Moyo, Arua; 2) Refugee response fund through OPM implemented by Oxfam, 5Mio Euro until 2021. Rhino Settlement, Arua district; 3) Support to operations and maintenance of water supply systems through UNHCR- 15mio Euro, all settlements in West Nile except Rhino camp. Ongoing until 2021, 4) Phase II of the WSDF-N support already committed but scope to be defined in 2020- 15mio Euro. To run from 2021 until 2024/25. 5) Programme on Water Supply and Sanitation for Refugee Settlements and Host Communities (current commission), GIZ, 10/2018-09/2021; 5,000,000; Focus on Arua (Imvepi and Rhino Settlement); technical Focus on capacity development of regional MWE units Lira (Umbrella and Water Management Zone) and District Local Government; support to MWE regarding the implementation of the Joint Response Plan; 6) IWMDP, World Bank, USD 58m (half grant); 7) WATSAN through MOFPED to MoLG, World Bank, USD 120 m; 8) Support to UNHCR for O&M in West Nile except Rhino Camp, KfW, 15m until 2021, 15 m until 2024; 9) Water supplu and Sanitation for Refugee Settlements and Host Communities in Northern Uganda, KfW, Arua District, 5m EUR in 3 years, Yumbe District 7-12 m EUR, 10) WatSan in ASrua and Support to NUWS, GIZ, 5m EUR;11) Pipied water supply and FSTP grand to EU Trust Fund: Arua, Kiryandongo, Adjumani and Yumbe, EU, 1.95 m USD.

It will be important for relevant stakeholders to investigate what is preferable for water provider and users, and more sustainable: one single large system (designed as one) but implemented in parts by different partners, or smaller systems designed in an *ad hoc* manner.

### 4.6.3 Misalignment between donor funding cycle and return on infrastructure investment

According to Nsamizi, donor funding cycles are unrealistic, as they are often planned and operationalised on an annual basis (Nsamizi Key Informant Interview, April 2019). This, according to the service provider, is not conducive to enabling sustainable investment planning for infrastructure upgrades and new infrastructure development. Such short cycles do not allow the time required to effectively measure the impact of interventions and to plan for the much-needed long-term investments, and therefore as a result creates the possibility for series of short-sighted infrastructure fixes. These rapid financing cycles, therefore, create an increased opportunity for misalignment between key institutions in terms of ensuring effective project review and coordinated use of financing.

### 4.6.4 Way forward: challenges with utilities taking over the O&M of water systems in refugee settlements

As discussed under section 3.3 (Institutional Analysis), NWSC and UAs have different attributes that make them appropriate to take over the O&M of water systems in refugee settlements. However, there will likely be challenges for these institutions as they expend their activities.

**NWSC**

There are some challenges which should to be addressed when NWSC takes over some schemes in refugee settlements. Firstly, it be believed that NWSC will only be interested in operating the most profitable schemes in refugee settlements. However, the NWSC practice is to use profitable systems to cross-subsidise less financially secure systems, which may be beneficial in the refugee water supply context. Further, if NWSC is to manage schemes, there is a need to put in place a solid system of subsidies for the most vulnerable individuals. NWSC is known for disconnecting systems when bills are not being paid; there is a risk that some public kiosks in settlements would therefore refuse to provide water to those who would not be able to pay to pro-poor payment, resulting in protection issues (Brown & van den Broek, 2018). The NWSC hope to continue growing and expanding their service and see the takeover of refugee systems as a definitive part of this growth.

**UAs**

Another set of challenges should be addressed if UAs do take over some water schemes in refugee settlements. Firstly, UAs lack experience working in refugee contexts, and have no experience of managing handpump. UAs have rapidly grown over the past year and operating the water services in the refugee areas may over stretch their capacity. This shows the need for capacity building trainings to remediate to this lack of contextual and technical knowledge, and the need for more human capacity, if the UA's scope was to increase

# 5 How to Improve Water Services Delivery in Refugee Settlements

*This chapter begins with a description of what a sustainable water supply system would look like. It then reviews how to improve the efficiency and sustainability of water supply systems in refugee settlements in Uganda – providing analysis and recommendations grouped under six critical areas of change.*

*These recommendations are addressed to actors operating in the field – from the Government of Uganda to UNHCR and its partners. In particular, it is hoped that these recommendations will provide useful baseline information for the Government's revision of the O&M framework for water supply and sanitation, for the Sector Response Plan, and in general to the government's IWMDP strategy.*

*The discussion around user fees and the transition towards a utility-based system is particularly important; with uncertain and sometimes volatile donor funding, adopting a reasonable user fee and allowing NWSC or UAs to take over water supply delivery will be key to guaranteeing refugee's satisfactory access to water in settlements. It is hoped that our analysis will help support this transition and the development of a fair and reasonable water tariff policy for refugee settlement areas.*

## 5.1 Characteristics of a sustainable system

While the present analysis recognises the difference between settlements (in terms of maturity, socio-economic characteristics of refugee population, etc.), a general description of a sustainable system can be drawn. A sustainable water supply system would be one:

1. That will meet the demand of refugee populations and host communities, as this demand evolves;
2. Which provides a service good enough to trigger widespread willingness to pay among beneficiaries;
3. Whose water fee revenue covers operation, maintenance and upgrades costs (it is assumed that the initial capital expenditure of the system is covered by a development or implementation partner); because of the low revenue of refugee populations, this equilibrium between revenue and O&M can only be achieved through an efficient technical system with reasonable O&M costs. This is a key sustainability feature as it is likely that O&M partners will have shrinking resources and might have to withdraw their services;
4. Which is fair to all and supportive of the most vulnerable refugees; subsidies to the most vulnerable should therefore be adopted as necessary;
5. Which is supported by strong institutions and simplified through streamlined processes.

A sustainable water supply system will only be the by-product of a transition from an emergency mindset to post-emergency, long-term development focused mindset.

## 5.2 Roadmap[92] to improved delivery: recommendations for action

While the root causes and manifestation of sustainability challenges are common to many or all water schemes investigated, the adequate responses to these challenges might differ from one settlement to the other**. While adopting a coherent overall strategy, the MWE, OPM and UNHCR should also ensure that each intervention is adequate (and potentially tailored) to each settlement.** Our case studies highlight that refugee settlements throughout Uganda have different characteristics, and that the water supply systems themselves have different features (cost, technology etc.). Interventions aimed at improving the sustainability of water systems will have to be adopted gradually. **To guide the design and implementation of these tailor-made interventions, the institutional and policy framework around water supply in refugee settlements should be strong.**

The detailed analysis of the six case studies and institutional study revealed six key observations, highlighted in orange. Each is associated with key recommendations. Figure 29 provides an overview of the key areas of recommendations.

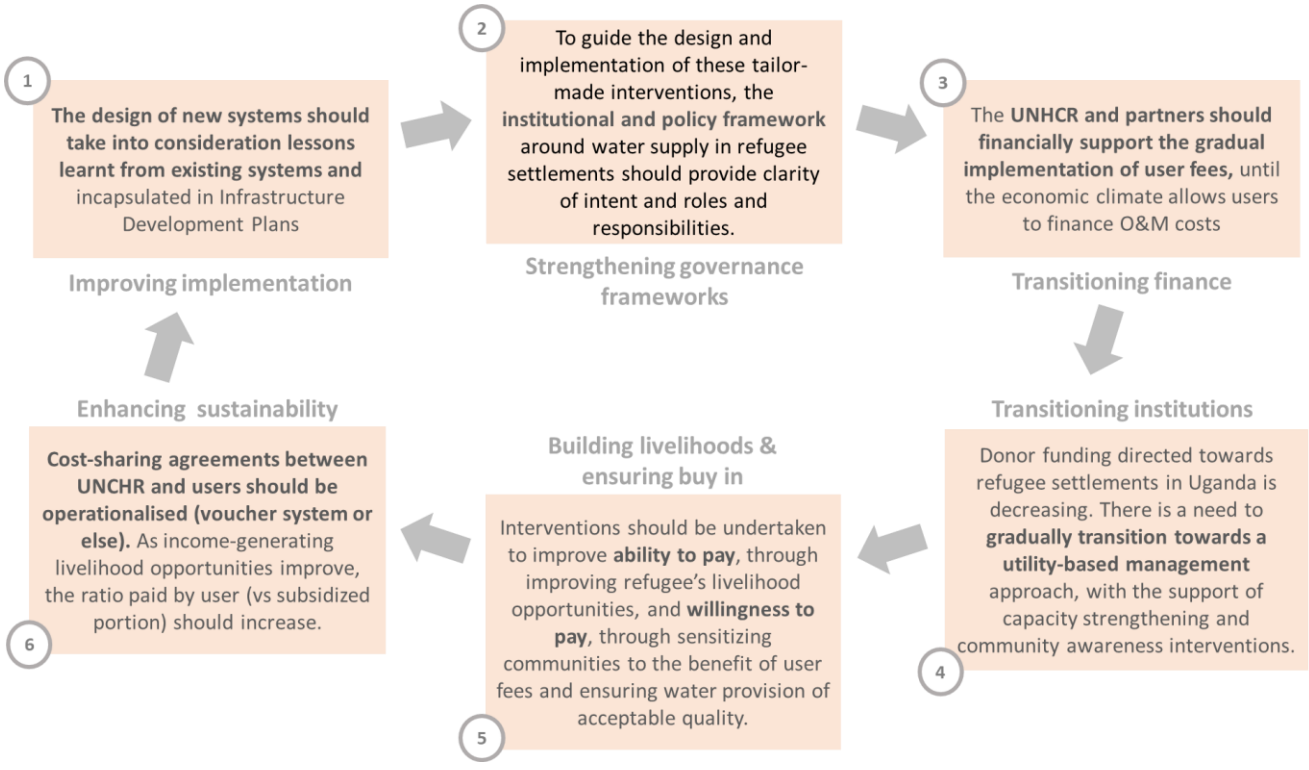



*Figure 28 Schematic representation of key areas of recommendations for intervention*

Refugee flows into Uganda are unlikely to stop in the foreseeable future, especially given the region's current instability (esp. in Sudan). The design of new systems should take into consideration lessons learnt from existing

[92] This is a suggested roadmap for the transition to the utility model, in accordance with UNHCR and MWE's plans to enhance the water supply systems' sustainability. Relevant authorities are expected to revise, add details and "own" the roadmap.

systems. This should be incapsulated in Infrastructure Development Plans (both national and regional plans) developed by the MWO and Provincial and District Authorities.

Key recommendations associated with these observations are as follows:

- **The Infrastructure Development Plans should advocate for the adoption, in refugee settlements, of flexible and transitionable design of new infrastructure which allow for "plug in" of additional components to adapt to the demand**. Our engineering analysis showed that, in a context where predicting flows of refugees is highly complex, such design would allow for more flexibility. Under this approach, systems can be altered to meet new and changing demands at a minimum cost and with minimum interruption. The concept of flexible and transitionable design has been cited by many scholars as an approach for dealing with uncertainty in water supply and sewerage systems (Zimmermann, 2006; Kluge and Libbe, 2006; Sempewo,2012; Seneshaw, 2012).
- **Infrastructure Development Plans should also advocate for the decentralisation of water supply design to ensure good performance for both regular and intermittent supplies.**
- **Finally, the MWE should ensure that the appropriate entities – within the MWE and at the local level – are equipped with capabilities to undertake a good streamlined review process of the technical designs in settlements before establishment to ensure alignment with government guidelines.**

***To guide the design and implementation of these tailor-made interventions, the institutional and policy framework around water supply in refugee settlements should provide clarity of intent and roles and responsibilities.***

Key recommendations associated with these observations are as follows:

- The Refugee Response SubGroup has the potential to play a critical role in improving water supply in refugee settlements. Given the high number and diversity of actors involved in the water and refugee protection fields, **the Refugee Response SubGroup should help bring clarity rather than complexity to the institutional architecture of water supply in refugee settlements.**

- The mandate of the Refugee SubGroup should be well defined and understood by all relevant stakeholders. **The Refugee Subgroup could play an important role in coordinating the numerous activities being undertaken by different actors supporting refugees in Uganda. It should also play a role to strengthen reporting, share lessons learnt and update provision in order to support improved coordination**. It is currently difficult to get a comprehensive overview of all activities being undertaken in different regions. The continuous support of key experts, as per the example of GIZ 's current support, will be critical to ensuring that the SubGroup is capacitated to fulfil its mandate;

- As part of its lesson learning and exchange of knowledge function, **the Refugee Subgroup should also organise regular information session should be organised for international partners to ensure their knowledge of Uganda policies and practices**; As an example of misinformation, our study showed that

knowledge on and compliance with Ugandan guidelines on establishing water boards was poor, leading the dysfunctional community management in Nakivale.

- **The MWE should ensure that the Water and Environment Sector Response Plan for Refugees and Hosting Communities in Uganda integrates key lessons learnt from past experiences in supplying water in refugee settlements, but also lays the foundation for the transition towards a utility-based system, including user fees and an appropriate subsidies mechanism**. It should also consider the impact of expanding productive activities by refugees on the environment.

- **The MWE should provide more clarity and directive around the allocation of schemes between NWSC and the UAs, considering the cost implications to refugee settlements under management by either institution.** Based our deep dive analysis, it appears that the systems in Ofua 6, Swinga, Zone 4 and Oruchinga are most affordable to customers when managed by an UA. The Nakivale and Nyumazi systems would be most affordable when managed by NWSC.

- The O&M framework will be an important tool to codify some of the above-mentioned interventions towards a more sustainable system. **The O&M framework should include a set of performance indicators specific to refugee settlements**. That would include appropriate guidelines to address challenges like storage.

  Further, it should **include a provision relating to the need for regular assessments of opportunities to boost efficiency of water systems.** This was seldomly done in the six schemes investigated but could be important to improve services and cut costs. In the same vein, it would be beneficial for **the O&M guidelines to give recommendations to cut costs**, e.g. providing guidance on the integration of different small systems for optimisation of capacity and lower cost. The potential for economies of scales should be thoroughly reviewed. Economies of scale could be realised by having partners or utilities operating at a larger geographic scope, to diminish overhead costs; they could also result from adopting a similar technology at a larger scale, allowing for bulk order or spare parts;

  In addition, while community-based management has shown to be an important facet of water systems' O&M in refugee settlements, it was found that the involvement of water committee members could be improved. It would therefore be useful for **the O&M framework to provide guidelines to ensure engaged community participation in O&M**, including guidelines on appropriate incentives (remuneration, provision of uniform and equipment) and necessary technical skills training. The impact of motivational incentives on the quality of community management should be considered. **Remuneration of community members is seldom clear, therefore guidelines on transparency would be highly beneficial**.

- Finally, the **MWE should ensure that the appropriate entities – including local government and DWO – are equipped with enforcement capability to ensure compliance with key policies and performance indicators** for system efficiencies such as energy efficiency, asset management, non-revenue water, and work ratio (ratio of O&M costs to cost of water supplied).

***For the sustainability of the systems, O&M costs of water supply systems should be recovered through the collection of water user fees. In most settlements, the poverty rates and lack of economic opportunities do not allow for cost recovery through user fees as of now. There is therefore a need for the UNHCR and partners to financially support the gradual implementation of user fees. The magnitude of this support will vary from one settlement to the other, because, as our study reveals, affordability varies greatly from one settlement to the other.***

Key recommendations associated with these observations are as follows:

- **Based on vulnerability studies undertaken throughout the country, the UNHCR should classify settlements according to their ability to pay for water services**; it is suggested that settlements should be divided in 3 categories: 1) Ability to pay is high (cross-subsidization is possible), 2) Ability to pay is present (cross-subsidization is not possible), 3) Ability to pay is low. In our sample of schemes investigated, Nakivale Base Camp, Oruchinga and Nyumanzi fall under category 1), Ofua 6 falls under category 2), and Zone 4 and Swinga in Bidibidi under category 3).
- **The adoption of water user fees should be gradual, over the next few years (up to a decade), firstly in zones/settlements falling under category 1).** As schemes/settlements are reclassified towards 1), user fees should be adopted. Further, user fees can also be implemented in settlements classified under category 2) and 3), but only if subsidies received by UNHCR/partners allow, as subsidies in these settlements should reach a much wider proportion of the population of a refugee settlement, if not all. **User fees should be implemented in a gradual manner (e.g. low fee, increasing with time), to ensure no users is exiting the system** (e.g. digging shallow well);
- **Where user fees already exist, the UNHCR and MWE should investigate the potential scope for an increase of user fees, until O&M costs are fully covered**. Among the sample investigated, there is scope to increase user fees to levels that improve cost recovery in the settlements where there is already water use charging (Nyumanzi, Oruchinga and Nakivale);
- **Where there is no user fee, and that the ability and willingness to pay is low, partners should introduce a small "symbolic payment" to stimulate the culture of paying for water**; This will gradually increase users' willingness to pay, and ultimately allow for payment of more significant user fees.
- **The UNHCR, partners, the MWE and utilities should continuously investigate and assess the potential for cross-subsidisation**. Under the management of water systems by UNHCR partners, the potential for intra-settlement cross subsidies should be investigated in settlements where some refugees have a relatively higher ability to pay (this is the case in Nakivale for example, where income inequality is high).
- **The MWE, OPM and UNHCR should jointly investigate the potential of cash-based incentives based on a minimum expenditure basket**. This would allow greater integration of services provided to refugees between supporting partners, but also enable greater autonomy by refugees to manage their budgets more specifically and efficiently and become more self-reliant. However, cash handout can trigger unfavourable reaction from the host population, which should be considered, and, if cash-based incentives are adopted, addressed in a fair manner;

- **The OPM, with the support of other relevant ministries and of the UNHCR, should explore the integration of refugees into national social protection schemes.** As equity between refugees and host communities is highlighted by the government of Uganda as a goal, exploring the integration of refugees in Ugandan protection schemes is a critical.

***While partners are undertaking tremendous efforts to provide water to refugees, donors funding directed towards refugee settlements in Uganda is decreasing. There is a need to transition towards a utility-based management approach. This transition should be gradual and supported by capacity strengthening and community awareness interventions.***

Key recommendations associated with these observations are as follows:

- **The MWE, with the support of donors, should undertake an assessment of capacity gaps and capacity building/strengthening needs for both the UAs and NWSC.** When it comes to the UAs, significant work has already been undertaken by independent consultants commissioned by the World Bank. A similar assessment of the capacity of NWSC should be undertaken;
- **Continuous capacity building/strengthening should be provided to NWSC and UAs by the MWE with the support of international donors.** Potential areas of focus include procedural and financial capacity strengthening. This will be key to ensure that the two entities will be able to increase their geographical scope of work and take over the management of water supply in refugee settlements from UNHCR partners;
- **Support to a hiring and training process** for new utility staff would also be useful, especially for UAs, as their need for a stronger human capacity will be critical as it grows;
- **When it deems that the transition would be beneficial, the UNHCR should work in collaboration with local leadership and local authorities on triggering the gazetting process, stating their preference for either NWSC or UAs;** While the UNHCR is able to request a gazetting process to delegate water supply duties to a utility, it is recommended that it acts in collaboration with local leadership. It is important for the entity triggering the gazetting process to consider what would be the most appropriate entity to supply water in the gazetted region, including in refugee settlements. **Considering the affordability, robustness and sustainability of the service** provided by both utilities will be critical. In this process, it is critical to engage the recipient communities, district councils and water offices to find a solution that is appropriate for all.

- **When negotiating an MoU with either NWSC or UAs for water delivery in a region, the UNHCR must make sure to consider lessons learns from other similar negotiation processes**; thus far, the MoU negotiation process between NWSC and the UNHCR for operations in Rwanwanja is an important example to consider;
- **Each negotiation process should consider the specific characteristic of the settlement** (tailor-made approach); further for any MoU negotiation, **the UNHCH must ensure that there is space for future changes and amendments**, as flexibility is critical in situation with high uncertainty;

- **The role of the OPM as permanent backstopping entity to guarantee refugees access to yard, compound or household connection should be better defined;** OPM's role helps overcome land title issue and provide guarantees to the utility providing individual connections.

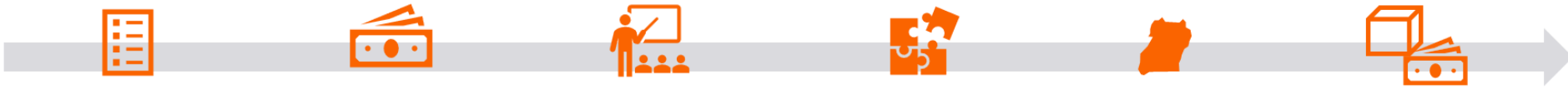
***Willingness and ability to pay will be critical for the sustainability of any water supply system (both managed by partners or by utilities). To support the capacity of refugees to pay for water and potentially other basic necessities – thereby improving their self-reliance and resilience – interventions should be undertaken to improve their ability to engage in productive activities, and to develop their skills. Further, partners and utilities should ensure that the quality of water systems is good enough to trigger willingness to pay among beneficiaries. Ensuring the buy-in of communities in the transition from partner-based to utility-based is another important factor for the sustainability of water supply in refugee settlements.***

- **The UNHCR and MWE should undertake regular ability and willingness to pay assessments; these will be critical to ensure that refugees are contributing the right amount to water supply, and that subsidies are adequate.** This is key to ensuring that water remains affordable and that user' contribution to O&M costs is maximized;
- While the UNHCR's recent strategy is not to undertake livelihood interventions itself, it will be important for the **UNHCR to coordinate the livelihood interventions of its partners in refugee settlements.** Improving the financial capacity of refugees will be critical to improving their ability to pay for water. Skills building should be an important component of these livelihood interventions. **The government of Uganda should also assist in establishing a socio-economic development policy in refugee hosting settlements**;
- **Where the groundwater source allows, it will be important for local authorities and the DWO to allow refugees and host communities to use hand pump for productive activities, which should help increase their income and improve their ability to pay for water**; community management structures should be put in place, as it is unlikely that NWSC or UAs would manage these water points (they would instead likely focus on centralised piped distribution). **Similarly, rainwater harvesting for both domestic use and productive activities should be promoted**;
- Our study showed that people's willingness to pay is strongly correlated to the perceived quality of services. **It is recommended that the transition from partner-based to utility-based system is introduced after system upgrades, co-financed by the UNHCR, MWE and the relevant utility**; in Rwamwanja for example, NWSC will take over the operations of the water system only after upgrades co-financed by NWSC and the UNHCR are completed.

***As water supply gradually turns towards a utility-based approach, i.e. as UAs and NWSC gradually take over the operation of an increasing number of settlements, the UNHCR and partners should financially support vulnerable refugees to ensure access to water. Cost-sharing agreements between UNCHR and users should be operationalised (voucher system or else). As income-generating livelihood opportunities improve, the ratio paid by user (vs subsidized portion) should increase.***

- In Rwanwanja, where the utility approach under NWSC is being implemented, UNHCR and MWE are discussing the adoption of a "water voucher" system to guarantee access to a minimum of 20 litres per household per day. Conversations on subsidy support are ongoing but are so far inconclusive (UNHCR, 2019). **The UNHCR should investigate and pilot different approaches to the operationalisation of cost-sharing agreements in the framework of the voucher system**, defining what proportion of the cost should be covered by the customers and UNHCR. While the recipient of the water vouchers has not yet been defined (some or all refugees), **it will be critical that the most vulnerable refugees get access to such vouchers**. It is also advised that **refugees paying a fee under the partner-managed system continue to contribute to the same level under the utility system**. Finally, it will be important to **consider whether host communities currently benefiting from water supply points in refugee settlements will be supported, and if not, how to manage the shift fairly and avoid any contentions**.
- Ensuring the financial support of partners is likely to be challenging. Fund raising campaigns around fee subsidies might be less attractive than that around managing water supply systems. To convince partners, the **UNHCR, MWE and OPM should put joint efforts in demonstrating the higher value for money of a subsidised utility system rather than a partner-based system** (highlighting economies of scale etc.). The process of seeking the buy-in of partners for financial support should begin immediately. Further, it will be interesting **to consider how the voucher system can allow partners to quantify the impact of their support**, which is appealing to donors.
- **The transition to a utility-based system should be done as a result of an engagement with the refugee community and a sensitization process**; ensuring the buy-in of beneficiaries will be critical to ensure the sustainability of the system. The benefits of user fees should also be discussed at length and supported by empirical evidence. Water committees and groups should transition to user groups, whose feedback to the utilities will be critical;
- **Local governments in refugee hosting districts and utilities should continuously engage to ensure that interventions are aligned with provincial and district plans**; while they have a common objective, to provide water for all, alignment on necessary steps to meet this objective between utilities and local government is important.
- **UAs and NWCS, together with the MWE, should continuously assess the possibility for cross subsidisation and undertake necessary tariff rebalancing**. NWSC is already cross subsidising its pro-poor rate through imposing slightly higher rather than cost-recovery rates in areas with higher income, such as Kampala. NWSC and UAs should ensure that their tariffs allow for organisational sustainability and for cross-subsidisation at the national level. Key principles to consider while reforming tariffs are economic efficiency, cost-recovery, fairness, financial stability, resource conservation and social orientation of water services (Almaty ministerial conference, 2000). UAs and NWSC should offer household connections to those able and willing to pay the standard price; the utilities should also, with the assistance of the UNHCR, regularly assess the potential for tariff rebalancing in settlements, as economic opportunities grow.

The following figure represents key transition activities to implement a water user fee, set to improve the sustainability of water systems in refugee settlements.



Studies/investigation:

- Larger household survey on WTP/ability (with statistical adjustments)
- Feasibility and robustness of different approaches to means-testing/price discrimination in the settlements
- Models by which refugees could be integrated into the planned expansion of Uganda's social protection policy, incl. cash-based support programmes
- Potential for subsidizations for user fee for the most vulnerable groups (and potentially full settlements) – sources?

- Decide on user fee amount and distribution (tailored to each settlement)
- Pilot testing?
- Introduction of higher user charges within settlements where affordability constraints are least binding (Nyumanzi, Oruchinga and Nakivale) in a way that reflects the distribution of income within those settlements.

- Upscale and improve the effectiveness of livelihoods support programme to stimulate income generating activities
- Regularly assess household income & other factors determining vulnerability – key to reduce risks associated with fee

*When relevant*

- Graduation of settlements from no water charging to low amounts (UGX 1000) and then progressively higher amounts – consider cross subsidization

- Potential expansion of Uganda's social protection policy (incl. refugees)

*(e.g. Kenya: Hunger Safety Net and Social Protection system extend to refugees in Turkana)*

- Provision of water is integrated into the national approach for water supply and water charging. Management of NSWC and/or UOs.

- Assess risk of volumetric charging (ensure it will not lead to a damaging in water consumption in specific households needs)

*If risk can be reasonably mitigated*

- Pilot a shift to volumetric charging in Nyumanzi for example
- Shift from charging on a per household basis to a volumetric charging while identifying the most appropriate institution to manage the scheme between NWSC or the UAs

*Figure 29 Schematic representation of the transition activities*

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# APPENDIX A Distribution of reported income across settlements of focus

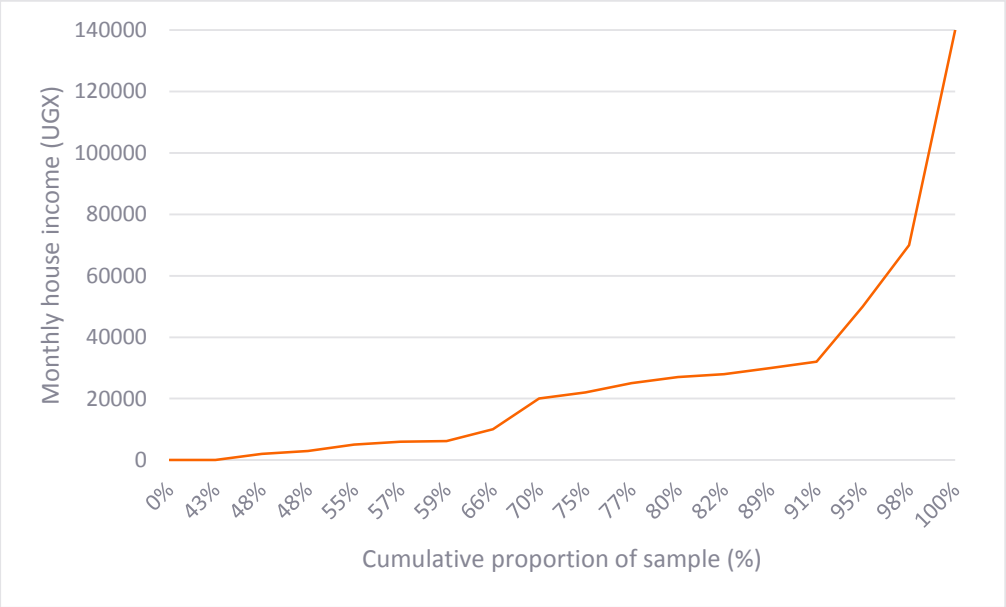


*Figure 30 Income distribution for Ofua 6*


*Figure 31 Income distribution in Swinga*

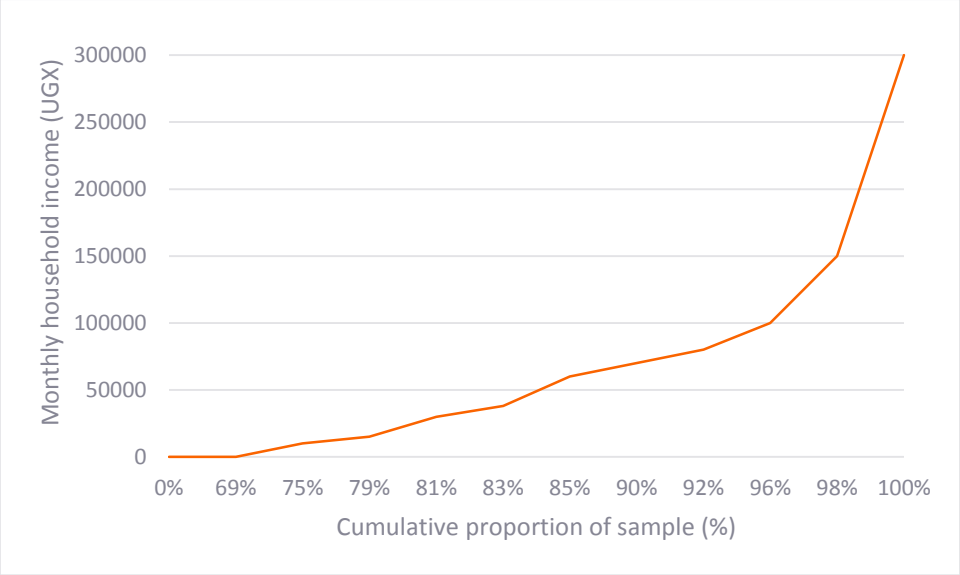


*Figure 32 Income distribution in Zone 4*

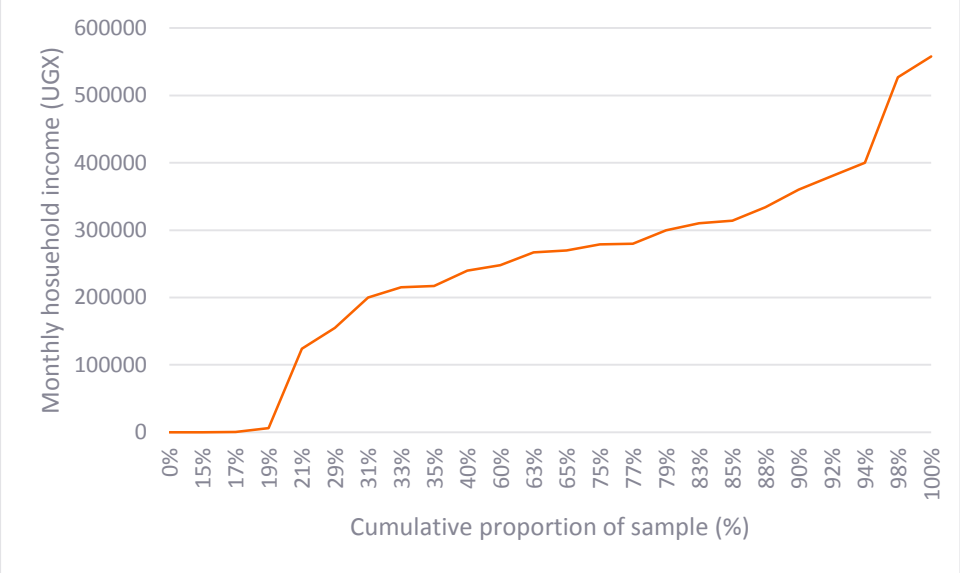


*Figure 33 Income distribution in Nyumanzi*

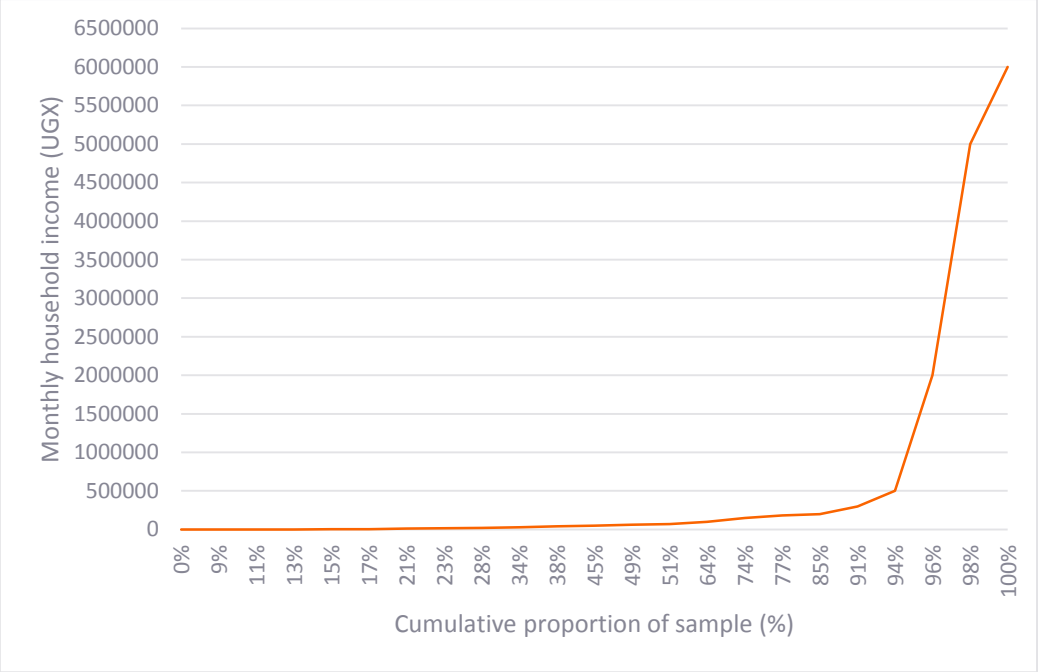


*Figure 34 Income distribution in Oruchinga*

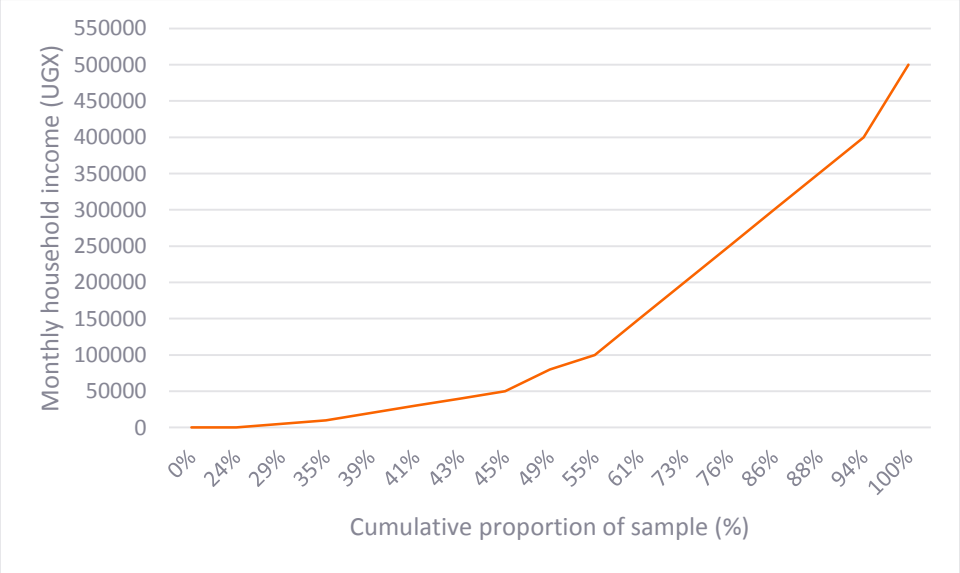


*Figure 35 Income distribution in Nakivale*

# APPENDIX B List of Interviewees

| Name | Position & Institution | Contact info | Place & date of meeting | Meeting type |
|---|---|---|---|---|
| Ministerial positions | | | | |
| Batista Dennis | Rhino Camp Settlement Commandant, OPM | 078 250 04 22<br>mbaptista@gmail.com | Arua, 01 April 2019 | Greetings |
| Kwizera Benon | Assistant Camp Commendant, Zone 2, Bidibidi | 0772408476<br>kwizerabenon@gmail.com | Bidibidi, 02 April 2019 | Greetings |
| Mutoawe Manok | Oruchinga Settlement Commandant, OPM | 077 6575844 | Oruchinga, 08 April 2019 | Greetings |
| David Mugenyi | Settlement Commandant, OPM | 077 2342686<br>Dmugenyi2004@yahoo.com | Nakivale Base Camp, 09 April 2019<br>In person meetings, June 11-14. | Greetings/discussion |
| Henry Peter Akena | Coordinator, Water and Environment Sector, Refugee Response Plan, Ministry of Water and the Environment | henry.akena@mwe.go.ug<br>henrykochkal@yahoo.com<br>256 776 444 233 | Telephone, 16 April 2019. Follow up interview to take place during the week of 13 May. | Update, discussion |

| | | | | |
|---|---|---|---|---|
| | | | In person meetings, June 11-14. | |
| Olweny Lamu | Principal Engineer, Ministry of Water and the Environement | llolweny@yahoo.co.uk<br>256772453395 | Telephone, 27 May 2019 | Q&A, Discussion |
| District Water Offices (DWOs) | | | | |
| Twerebere Jack | DWO Isingiro | +256701-112500<br>+256782-873075 | 23 July 2019 | KII |
| Stephen Obitre | DWO Arua | +256772-666850 | 25 July 2019 | KII |
| Representatives of DWOs in Yumbe (Bernard Magara) and Adjumani (Richard Izakari) were contacted but did not respond to our request of interview.<br>Bernard Magada: Tel. +256 776 548 308<br>Richard Izakari: Tel. +256 772 584 363 | | | | |
| UNHCR | | | | |
| Joseph Aluba | Assistant WASH Officer (NOA), UNHCR, Arua | aluba@unhcr.org<br>+256 771460284 | Arua, 4 April 2019 | KII |
| Sheila Akullu | Senior WASH Associate, Yumbe Sub-Office, UNHCR | akullu@unhcr.org<br>0772710121 | Telephone, 4 April 2019 | KII |
| Charles Kiwalazi | Assistant WASH Officer (NOA), UNHCR, kiwalazi@unhcr.org | Kiwalazi@unhcr.org<br>+256 789483650 | Telephone appointment for the week of 13th of May | KII |

| | | | | |
|---|---|---|---|---|
| Juliet Ojeo Mwebesa | Associate WASH Officer (NOB), UNHCR, Mbarara | mwebesa@unhcr.org<br>+256 772710140 | Nakivale, 10 April 2019<br><br>Telephone interview, 15 August 2019 | KII. The livelihood officer also kindly joined to input the KII livelihood section;<br>KII centred around Rwanwanja |
| Samuel Forkpa Davis | Associate WASH Officer | Mobile: + 256772710137<br>Email: forkpa@unhcr.org | | KII centred around Kiryandongo |
| Service providers - Partners | | | | |
| Rael Akakoro | WASH Officer, DRC | r.akakoro@drcuganda.org | Rhino Camp, 01 April 2019 | KII |
| Susan Kasemire | WASH Focal Person, Water Mission | | Bidibidi, 02 April 2019 | KII |
| Philomena Achab | NRC | | Bidibidi, 03 April 2019 | KII |
| Alex Kagona | Peace Winds Japan | | Bidibidi, 03 April 2019 | KII |
| Maxwell | WASH Officer, LWF | 0782572093 | Adjumani, 05 April 2019 | KII |
| Peter Kakuru | Project Manager, Nsamizi | 0772053981 | Kavingo, 08 April 2019 | KII |
| Daphine | WASH Officer, Nsamizi | 0779515577 | Kavingo, 08 April 2019 | KII |

| | | | | |
|---|---|---|---|---|
| Pittson Omar | WASH Assistant for Oruchinga, Nsamizi | 0776589544 | Kavingo, 08 April 2019 | KII |
| Jean Baptiste Ntirenganya | Water field Officer/NSAMIZI/UNHCR Nakivale settlement | +256 772044106 tracyjessy@yahoo.fr | Nakivale, 08 April 2019 | Input to KII |
| Anita Nasasira | Nsamizi Project Coordinator | Anitanasasira2@gmail.com 0776197600 | Nakivale, 08 April 2019 | Input to KII |
| Service providers – UA/NWSC | | | | |
| Godfrey Katongole | Senior Manager in charge of Planning and Corporate Strategy, NWSC | godfrey.katongole@nwsc.co.ug | Telephone, 25 July 2019 | KII (Godfrey was recommended by Charles Ekure) |
| Mahmood Lutaaya | NWSC | +256 751 117 120 mahmood.lutaaya@nwsc.co.ug | Telephone interview, 12 August 2019 | KII |
| Experts | | | | |
| Reinold Seidelmann | Consultant, Umbrella Authorities expert | reinold.seidelmann@gmx.at | Telephone, 15 July 2019 | KII |

In addition to these one-on-one interviews, the team has attended a series of meeting with the MWE, UNHCR and other key stakeholders in Kampala from June 11 to 14th, as part of the "Integrated Water Management and Development Project (IWMDP), Strengthening Provision of Service Delivery in District Hosting refugees (TA)" organized by the World Bank.