# Turning tides: a systemic approach to intervention in the water sector

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*Reliable access to clean water remains one of the key global challenges of our time. Over 10 per cent of the world's population do not have access to clean drinking water, a figure which doubles when applied only to rural areas, more than 20 years after the end of the International Decade for Drinking Water Supply and Sanitation. This paper builds on theoretical literature examining the failure of traditional approaches to development intervention in the water sector and the potential for use of an alternative approach. This paper applies a mixed methods approach to the Making Markets Work for the Poor (M4P) diagnostic process in examining systemic constraints facing the water sector in Bugiri and Namayingo Districts of south-east Uganda. The results of a household survey, in-depth interviews, and secondary data analysis help to explain why previous models' interventions in these areas have failed to deliver sustainable service provision. It then uses these findings to develop a model that has the potential to address constraints in such a way as to deliver lasting improvements in high-quality water services delivery. The data presented aims to add empirical weight to the theoretical case for adopting analysis-based, context-specific models of intervention, with development actors working through partners to facilitate change, rather than actively participating in a system.*

**Keywords:** WASH, operations & maintenance, Uganda, making markets work for the poor (M4P), rural water supply

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The data presented in this paper aims to add empirical weight to the theoretical case for adopting analysis-based, context-specific models of intervention, with development actors working through partners to facilitate change, rather than actively participating in a system. It is structured in three sections: a research section focused on an analysis of current development practice and the theory behind systemic change initiatives as an alternative; findings and analysis from research conducted on behalf of GOAL Uganda in Bugiri and Namayingo Districts of south-east Uganda; and finally a conceptual programme design based on this research.

## Current practice and origins of an alternative

### *Development's intervention in water: a WASH out?*

The Springfield Centre has categorized development interventions in water and sanitation under three headings: direct delivery, knowledge transfer, and systemic change initiatives (outlined in Table 1). Looking specifically at interventions in rural water supply, the sector has historically applied strategies that fit a combination of the first two (SDC, 2009; Taylor, 2013). Traditionally, an intervention involves the drilling or installation of a water point, combined with training a committee consisting of community representatives to oversee the maintenance and collection of fees associated with the new point. This system should be familiar to those working in WASH, and has often been referred to as community-based management (CBM).

Koestler et al. (2010) have attempted to unpack the historical roots of, and current emphasis on, CBM. According to them, the model was developed in the early 1980s as a response to the failure of newly independent governments to adequately provide services to their people. It was deemed attractive by Western donors because it placed emphasis at the community level and was based (at least theoretically) on the principles of cost recovery and sustainable service delivery. While this model has had success in raising coverage across sub-Saharan Africa, there is an evolving consensus that CBM has reached the limits of its effectiveness and it is time to explore alternatives (Moriarty et al., 2013).

**Table 1** WASH interventions by type of approach

| | *Direct delivery* | *Knowledge and skills transfer* | *Systemic change* |
|---|---|---|---|
| Diagnosis of the problem | Inadequate physical resources, i.e. hardware, infrastructure, facilities | Inadequate knowledge and skills among WASH providers and consumers | Multiple constraints on the effective functioning of the WASH system, i.e. information, knowledge, rules, services, etc. |
| Strategy for intervention | Delivery of physical resources | Technical assistance to improve knowledge and skills | Interventions to address the root causes of constraints |

*Source*: Taylor (2013)

According to a synthesis of relevant research by the Rural Water Supply Network (2009), approximately 36 per cent of all hand pumps in rural sub-Saharan Africa were completely non-functional. This figure varies across contexts and likely needs to be updated; however, the overall picture is fairly consistent with more recent studies (Improve International, 2015). Uganda is no exception, where the CBM model has been codified into law (MWE, 2011). According to the most recent *National Water Atlas* (MWE, 2010), nearly 20 per cent of water points across Uganda were deemed non-functional during site visits – defined as not being able to pump water at all.

Given the methodological challenges of reliable data collection, as well as political incentives to report successes over failures, this figure is likely optimistic. For example, when independent random checks were undertaken at 46 of 1,426 points in Kanungu District of Uganda between 2008 and 2009, functionality was determined to be 40 per cent (Koestler et al., 2010). Kanungu's official functionality rate was 78 per cent at the time (MWE, 2010). A similar analysis of 45 surveyed water user committees (WUCs) in post-conflict areas across Uganda's northern districts, reported that 36 per cent of points were non-functional and an additional 24 per cent required either minor or major repairs (Truelove, 2013). This, of course, is in a region that has received considerable donor funding over the past two decades.

When taking into consideration reliability of water committees, the problems with CBM become even more obvious. For example, IRC's Triple-S initiative recently undertook an extensive review of WUCs in eight counties across Uganda, interviewing 1,432 households and 103 committees. They found that only 39 per cent were deemed to be 'functional', based on criteria of transparency related to fee collection and storage, operation & maintenance (O&M), capacity, committee composition, and internal management (Bey, 2014). While WUCs in many cases were operational, the majority failed to collect enough funds for maintenance or even repair of broken points. In such cases, local community members would simply revert to collecting from unsanitary sources of open water.

In short, while community management models have had an impact on improving water coverage in rural Africa, functionality rates remain stubbornly low and actual quality of service can be poor.

### *Systemic approach to intervention in water: the theory*

At its core, the reason why CBM tends to fail resides in the notion of a self-sustaining community (WaterAid, 2011). The logic goes that the key problem limiting water access in rural Africa is one of access to capital and knowledge. Therefore, if new infrastructure is built, structures are put in place, and communities are sufficiently 'sensitized', then a model of community management will be successful. In reality, this type of model presents myriad challenges related to incentives for fee collection, life-cycle costs of long-term operations and maintenance, spare part supplies, and storage of fees over a long period.

Increasingly, the need for more effective, sustainable approaches to addressing rural water supply gaps is recognized within development circles. WaterAid (2011), SNV (2012), WSUP (2012), Water for People (Breslin, 2014), The Springfield Centre

(Taylor, 2013), and various academics (e.g. Koestler, 2008; Moriarty et al., 2013) have all made strong arguments in favour of alternative approaches to water service delivery. IRC in particular has advocated for professionalization of rural water supply – through arrangements with both the private and public sectors in local contexts – after a rigorous 13-country analysis of WUCs (Lockwood and Smits, 2011).

As evidence of this recent shift in mind-sets, the Institute for Sustainable Futures has highlighted a huge growth in approaches that involve engagement with small-scale private and social enterprises to 'professionalize' service delivery (Gero et al., 2013). The nature of these approaches varies and includes interventions involving the development of user associations, private–public partnerships with larger enterprises, franchisee models, licensing agreements, and various social enterprises (see for example Whave, 2013). Especially in French West Africa, there is a growing rise in private contract models (WSP, 2010). Burkina Faso, for example, has been working with a model that resembles the one proposed below, in which a private firm is awarded a hand pump maintenance contract across multiple districts (WSP, 2011).

The research presented in this paper will not compare the relative merits of any one type of model over another; both because analyses of the comparative advantages of different service delivery models can be found elsewhere (see for example Tiwari, 2013; Koestler, 2008; Taylor, 2013), and because of a need for context-specific analysis and solutions. Similarly, the data presented below is not meant to contribute to a debate on private versus public initiatives in basic services – as this conversation can limit the search for innovative solutions to entrenched problems (DFID and SDC, 2008). Instead, this research highlights the necessity for any approach to rural water supply to focus on both the incentives and capacities of service providers (whether public, private, or some combination thereof) to provide affordable, responsive access to safe water.

## Research to date

This section outlines the research and current hypotheses of GOAL Uganda's Sanitation, Water Operations & Maintenance (SWiM) project diagnostic team. Research was conducted in collaboration between GOAL Uganda (GU) and Pollen Group, an East Africa-focused consulting firm specializing in the application of systems thinking and systems-change approaches to development.

The team drew heavily on the M4P approach (Springfield Centre, 2014) when identifying barriers and potential solutions for the long-term provision of quality water as well as sanitation products. This paper, however, will focus exclusively on research pertaining to O&M of water points.

### *Context*

Functionality of rural water sources is perhaps the biggest challenge to the water sector in Uganda today. While there has been significant progress in improving access to safe water, these gains have been undermined by an ineffective approach to routine maintenance. This has a correspondingly negative impact on the lives of Uganda's rural population and significantly reduces the impact of previous investments.

There has not been sufficient attention given to sustainable mechanisms for O&M with consideration of the full life-cycle costs of service provision.

Bugiri and Namayingo Districts – formerly consolidated as Bugiri prior to 2010 – lie in the south-east of Uganda where GOAL has been operational since 2001. These districts have some of the lowest water coverage – defined by the Ministry of Water and Environment (MWE) as access to a clear source within a reasonable distance – in the country. Consequently, GOAL has invested directly in water provision and infrastructure projects while coverage rates remain stubbornly low. This is especially the case in Namayingo, which suffers from the additional challenges of high salinity for existing water points and lower population density.

Bugiri District has a dense population of 468,600 people. There are 540 hand pumps, of which 87 per cent are functional (MWE, 2013). However, overall water coverage across the district is only 52 per cent. Namayingo District has a population of 255,300 people and is more densely populated along the shores of Lake Victoria. There are 268 hand pumps, of which 78 per cent are functional; but overall water coverage across the district is astonishingly low at 36 per cent (MWE, 2013).

### *Methodology*

Drawing heavily on the M4P approach, the team undertook a market diagnostic exercise from December 2014 to March 2015. The research focused on the demand for, and supply of, safe water as the primary point of analysis, while emphasizing that functional markets include an effective enabling environment and the necessity of viable support markets such as spare parts supply from a reliable source. Specifically, the team's research questions focused on current functionality rates, ability (versus willingness) to pay for water, the capacity of existing service providers to perform O&M functions, and the ability of current WUCs to oversee existing points in the two districts.

Research involved a mixed methods approach drawing on the following elements to establish a holistic picture of how the O&M market operates in the two districts:

- a detailed household survey of 448 water user households across the two districts, utilizing a random sampling method based on MWE data of existing water points;
- a follow-on detailed survey with a smaller sample of 50 water users;
- a secondary literature review of market-led development interventions in WASH, with emphasis on Uganda;
- short surveys of 60 Water User Committees (WUCs) and 20 technicians linked to the Hand Pump Mechanics Associations (HPMAs) of both districts;
- semi-structured interviews with relevant private and public sector actors – e.g. the District Water Officer (DWO), several local MPs, the HPMA chairperson, and numerous Local Chairpersons (LCs);
- a focus group discussion with local leaders (DWO, LCs, Community Development Officers (CDOs));
- key informant interviews with relevant NGOs, researchers, and social enterprises working in Uganda's WASH sector, with emphasis on those working in Bugiri & Namayingo.

The household survey focused on current demand for safe water in both districts. It involved a random sampling of households within eight sub-counties geographically dispersed across the two districts. Within each sub-county, enumerators were randomly assigned eight villages across four parishes. Each enumerator then interviewed seven households per village, utilizing a method of interviewing every third house. Over eight days of data collection, the team was able to interview 448 households. As part of this extensive questionnaire, participants were asked about their perceptions of the local WUC, water access, and willingness to pay for services. The questions were oriented towards customer satisfaction with water quality and point functionality, willingness/ability to pay more for better services, and current satisfaction with local WUCs. The purpose of the survey was ultimately to ascertain if there was market potential for an alternative O&M model.

The secondary literature drew heavily on IRC's TripleS Initiative that explored sustainable options for water service provisioning across Africa (and their great wealth of information on Uganda in particular), the work of Dr Ben Taylor at the Springfield Centre, the research of Lucrezia Koestler (2010, 2008) and her colleagues, as well as Engineers Without Borders Canada's Water and Sanitation team (2014).

Short surveys for WUCs and technicians focused on current supply of safe water to local communities and O&M services. Selection criteria were less stringent than with the household survey as these interviews were deemed to be qualitative in nature. All technicians working with the Hand Pump Mechanics Association in both districts were interviewed, while WUCs were identified through technicians with the caveat that they must not reside in GOAL intervention areas to avoid biasing results. For WUCs, questions focused on attempting to benchmark current functionality of WUCs across the two districts based on ability to collect fees, financial management, emphasis on O&M as opposed to simply repairs, and levels of support from the district government. Discussions with technicians focused on demand from WUCs for their services, access to spare parts, and payment for services rendered.

Semi-structured expert interviews with government and the private sector were based on a series of questions brought to the discussion, but were kept relatively open-ended in order to deviate from the script in circumstances where informants made any interesting observations that needed to be further explored. A follow-on local leaders forum brought together relevant actors to discuss the parish water board model.

Lastly, key informant interviews were scheduled with relevant development sector actors involved in WASH work across Uganda, as well as follow-up discussions with those that were pursuing work that fit within the aforementioned criteria for systemic change approaches. Figure 1 shows a simple graphic of the team's methodological approach, utilizing the M4P 'doughnut' as a visual.

### *Findings*

*Current water sources: access and functionality.* The household survey largely corroborated MWE data on Bugiri/Namayingo. Surveys focused on functionality and access

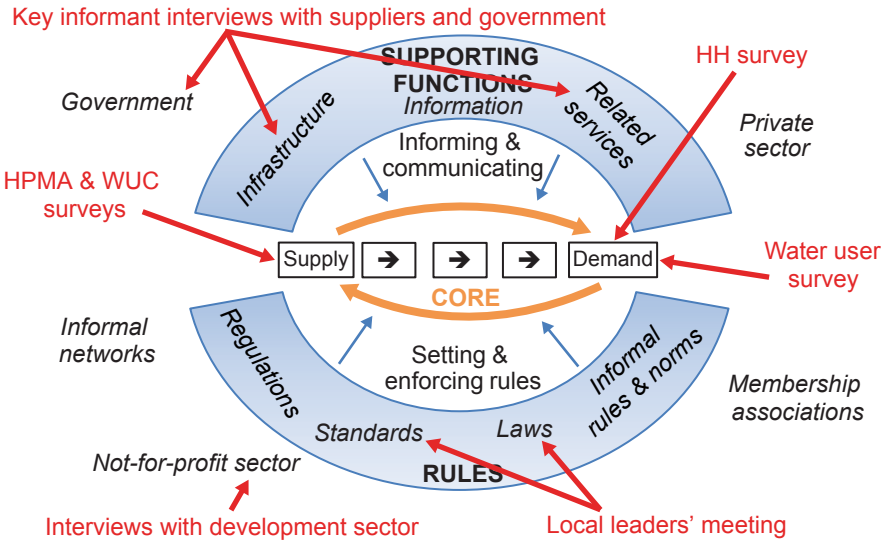


**Figure 1** The SWiM team's diagnostic approach

to safe water for those households linked to a Water User Committee, which biases in favour of greater coverage. Nonetheless, 24 per cent of households interviewed were accessing water from an open source (i.e. an unprotected spring, pond/lake, open puddle, or unprotected well). Of the 302 respondents that were accessing water from a borehole, 42 per cent had experienced a breakdown in the past 6 months: 16 per cent of respondents reported a breakdown between 3 and 6 months earlier, 20 per cent within the past 1–3 months, 4 per cent within the past 3 weeks, 1 per cent a week ago, and another 1 per cent of respondents reported a breakdown within the past week.

While this data suggests a high frequency of breakdown, this is partly expected in the region, where boreholes need to be dug at a significant depth (upwards of 60 m) and there is a high level of corrosion due to water salinity. What is more troubling is the lag time of repair, which data seems to suggest has contributed to the use of open sources in borehole catchment areas. Of 302 borehole water users, 26 per cent reported repair times of 3–6 months, with an additional 5 per cent claiming that their water source has never been repaired. Causes of breakdown were partly due to vandalism (30 respondents) or seasonal changes (12 respondents). However, the majority of problems were due to simple mechanical failures. From surveys with WUCs, the biggest cause of breakdowns related to pipes (40 per cent), pump buckets (30 per cent), or issues with bearings (25 per cent).

*Water user committees*. Surveys with 60 randomly selected WUCs across the two districts (in non-GU intervention areas) indicated that they largely existed to react to breakdowns, as opposed to preventing them. For example, when asked about the frequency with which WUCs meet, the number one answer (30 per cent) was 'When a breakage occurs'. This mirrors collection rates. When asked how often funds were

collected, the majority responded either in response to breakdown (45 per cent) or never (12 per cent), with another 9 per cent collecting only on an annual basis.

When asked about which community members contribute to the WUC, the majority of respondents (59 per cent) mentioned that less than half of their community pays at all. For those that did not pay, there were few consequences. The majority of WUCs (71 per cent) did not enforce collection; in reaction to non-payment, they continued to allow users to access water. When asked to elaborate on why this was the case, most WUC members emphasized either fear of, or tangible examples of, violence or overt community pressure.

Not surprisingly, very few WUCs had significant cash reserves available at the time of the site visit, as highlighted in Figure 2. According to interviewed hand pump mechanics, the average cost of a minor repair was around USh70,000 including labour (around US$23), meaning even simple repairs were outside the available cash balances of most WUCs. It was estimated that a minor repair would be needed at least bi-annually, making $50 a reasonable cash balance for any one WUC.

*Willingness to pay.* On the demand side, non-payment was not directly connected to level of household income; 78 per cent of WUCs surveyed mentioned that lack of payment reflected users' unwillingness, rather than an inability, to pay for water. This was corroborated by household survey data, which found that the average and median monthly household incomes of respondents were $38 and $20, respectively, while water fees expected were $0.33 monthly or less. IRC came to similar conclusions regarding willingness versus ability to pay for service in other parts of Uganda (Magara, 2014).

Related, informant interviews with the DWO indicated that a local politician had promised to fix all broken down points in Bugiri District, recently leading to further dips in payment. This was corroborated by conversations with water users. From the

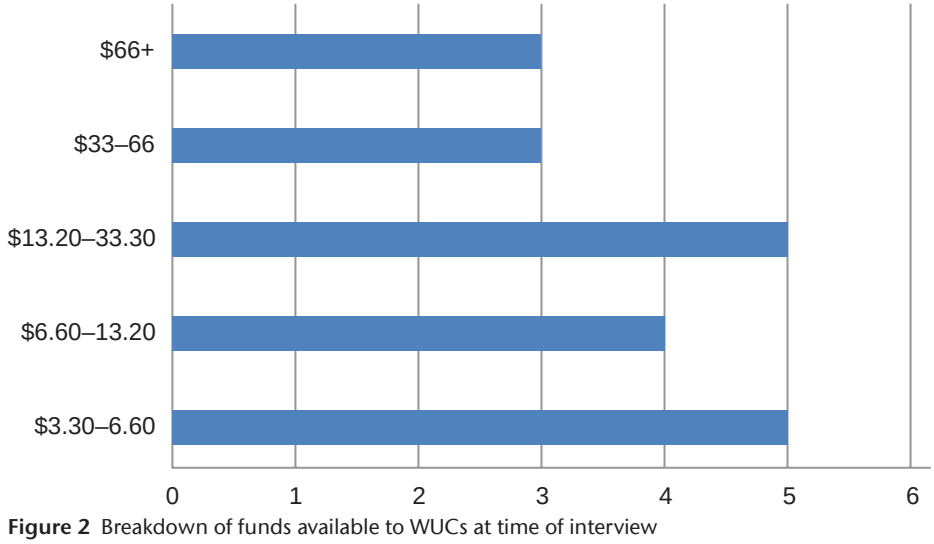


**Figure 2** Breakdown of funds available to WUCs at time of interview

sample of 50 random water users interviewed in a follow-on exercise, 19 claimed to not pay for water at all. When asked why they refused to pay, 10 of the 19 claimed that it was the responsibility of local politicians to provide free water, and only one claimed that they could not afford current rates.

*Hand Pump Mechanics Association.* According to short surveys with HPMA technicians, in instances where technicians were contacted to fix a pump failure, over 90 per cent were at the point site within a day. This was validated by the household survey, where respondents generally suggested that mechanics arrived within 1–2 days of a breakage. The response rate was lower in areas where there was higher demand for the technician's services, but overall rate of response was not a major issue.

Access to spare parts was not a major issue either. The technicians interviewed noted that they could generally access the spare parts needed for most repairs from either nearby Iganga or Jinja. The DWO had also decided to store parts at their office for a period of time but it was difficult to organize on top of their official duties. The only parts that were noted as particularly difficult to access and transport were stainless steel pipes, which are exponentially more expensive in any case and thus would have to be heavily subsidized.

### *Analysis of findings*

Over the course of the diagnostic exercise, it became clear that the main issues being faced by communities related primarily to collection of user fees. Contrary to initial hypotheses, the availability of spare parts, HPMA training, and access to finances were not the key drivers of poor sector performance in O&M. Speaking to technicians, it was clear that they were available to work when needed, had the relevant skill-sets, and were able to provide minor or fairly major repair services on a timely basis.

Instead, the community-based management system, originally set up as a solution to limited government capacity and finances to provide rural water, was not particularly effective in either district for a number of reasons. Firstly, WUCs had very limited funds. As highlighted, 62 per cent of WUCs surveyed had no funds at all and only 10 per cent of those that did had more than USh100,000 shillings (roughly $33) available. Related, survey data found that, generally while technicians arrived within one day after they were called for a repair, the actual collection of funds to pay for that repair could take months. Often technicians would receive only partial payment for services rendered and again waited several months to receive full compensation for their labour. When asked why this was the case, WUC members often alluded to the limited amount of leverage they had to extract payment from individual households.

From conversations with the DWO, it was clear that they had neither the funds nor the mandate to provide continued O&M support to every point in either district. Of Bugiri DWO's $225,000 annual budget, only 8 per cent was available for what are called 'software' activities such as supporting O&M of current points. The majority of their budget (70 per cent) was spent on building new water sources, with another 13 per cent allocated for major repairs.

NGOs working in Uganda's water sector are well aware of these issues and have begun to adjust activities to reflect the reality of the situation. Some of them have focused on the need for additional capacity building activities for WUCs and service providers with emphasis on financial management and enforcement. Efforts in this regard included, for example, a number of initiatives to professionalize existing HPMAs. Other NGOs emphasized the need for better information systems. Still others were looking to technological solutions such as metering existing pumps in an effort to enforce payment.

Many of these solutions, however, did not address the very serious demand issues within the existing CBM model. It was clear from this research that the primary challenges faced for water service delivery in the two districts related to current incentives aligned towards payment for *repair* as opposed to payment for *maintenance*. Put simply, water users see no reason to pay for services while a water point is working and WUCs find themselves scrambling to collect funds when it is not. This creates undue strain on the hand pumps in question and exacerbates the cost of major repairs. Any solution focused on sustainable service delivery will need to address these underlying disincentives to payment for maintenance in order to be effective.

## Concept for programme design

Based on analysis of O&M failures in Bugiri and Namayingo Districts, as well as a critical review of potentially innovative new models, the following outlines a model for professional rural water O&M service provision with support from both the private and public sectors.

This model would involve a service contract between the DWO and potential service providers, in which a provider is licensed by the DWO and paid by local WUCs after a quarterly service. If repairs are required, then the service provider would be expected to make them using its existing capital – with the potential for DWO support where necessary. The interventions outlined below would be expected to transform behaviours and practices of existing market players in order to stimulate lasting change. Namely, that:

- *An O&M service provider adopts and markets a new O&M service contract with WUCs*. This component addresses the issue of consistent, reliable service. GU's working hypothesis is that if users see that they are paying for a service such as regular minor repairs, then they are more likely to continue to buy into the model.
- *WUCs adopt a new mobile payment system and collect regular water fees*. This component addresses the need for the transparent management of funds. WUCs in Bugiri/Namayingo are often not trusted because they are often assumed (whether legitimately or not) to be stealing money from local water users.
- *Government increases its influence in regulation and enforcement*. This component addresses the need for effective enforcement of rules and consequences for non-payment. Any model will involve an element of non-compliance. Once

a non-compliant group becomes a significant minority, however, the model is likely to fail; meaning there is a need for a regulatory body to step in when payment rates dip below an agreed threshold.

### *New O&M service contract with WUCs*

As highlighted above, current response rates for repairs and access to spare parts were not major constraints to sustained rural water access. The Hand Pump Mechanic Associations (HPMA) of Bugiri and Namayingo provide the majority of repairs in both districts. However, neither have a coherent business model or any working capital as both were established and run on a semi-voluntary basis. As noted, mechanics can often wait months for payment after services rendered. Both associations are fractured by internal conflicts and their governance structures were not founded on the basis of a profit motive. Despite these limitations, there is evidence that some members have business acumen and could be potential service providers.

Based on initial analysis, there exists a business case for a private sector led O&M service. This would be based on a contract model between the provider and WUCs for the delivery of a fixed maintenance schedule and repair of all breakdowns over a one-year period. Based on initial calculations, payment would be in the form of a standardized quarterly fee of approximately $1 (to be determined in coordination with the District Water Office) per household. This figure was based on the assumed minimum required to pay for one major and two minor servicing per year (assuming the maximum cost of servicing), to ensure an adequate cash balance at a 60 per cent payment rate. See Table 2 for high-level cost assumptions.

The service provider would be expected to raise revenue and hedge financial risks by aggregating WUCs into the system – the calculations in Table 2 are based on eight water points. The model would operate similarly to many insurance markets, in that each WUC in Bugiri/Namayingo would be required to have a service provider but that which provider they choose would be left to their discretion.

GU would then work with identified service providers to pilot the new maintenance and repair service contract model; existing technicians will most likely work under a franchisee model with the service provider(s) in question. The O&M contract would cover the costs of all spare parts and labour during and between quarterly services. GU would work with the service provider to further develop their business model and marketing strategy as well as link the business to technical, business, and financial services, as well as mentoring if necessary.

Incentivizing communities' willingness to pay for water fees is the foundation on which the model is premised. In order to be successful, service providers need to actively market their offering and progressively increase the number of WUCs signed up to the service contracts. They would be responsible for marketing their services and progressively increasing the number of contracts by providing timely and quality servicing. GU would support the system in its adolescence by agreeing to cover the cost of all major repairs within the first year of the model, as the service provider will require time to develop a capital reserve. GU would also work closely

**Table 2** Cash projections for service provider

| | | | | | |
|---|---|---|---|---|---|
| Avg. no. paying HHs | 225 | 225 | 225 | 225 | |
| Avg. no. pumps per parish | 8 | 8 | 8 | 8 | |
| Payment per HH (UGX) | 3000 | 3000 | 3000 | 3000 | |
| Income (UGX) | 5,400,000 | 5,400,000 | 5,400,000 | 5,400,000 | |
| Income @ 60% collection (UGX) | 3,240,000 | 3,240,000 | 3,240,000 | 3,240,000 | |
| *Expenses* | | | | | |
| 3 × minor service (UGX) | 400,000 | 400,000 | | 400,000 | |
| 1 × major service (UGX) | | | 6,400,000 | | |
| *Admin* | | | | | |
| Bonuses @ 3% (UGX) | 97,200 | 97,200 | 97,200 | 97,200 | |
| Stationery (UGX) | 300,000 | 300,000 | 300,000 | 300,000 | |
| Bank fees (UGX) | 7150 | 7150 | 7150 | 7150 | |
| Travel (UGX) | 50,000 | 50,000 | 50,000 | 50,000 | |
| Audit fees (UGX) | | | | | 500,000 |
| Total (UGX) | 854,350 | 554,350 | 6,554,350 | 554,350 | |
| *Cash balance (UGX)* | *2,385,650* | *5,071,300* | *1,756,950* | *4,442,600* | *3,942,600* |

with community development officers (CDOs) – district officials tied to the DWO responsible for health- and sanitation-related outcomes – to actively engage with communities on behalf of service providers as an arbiter of goodwill and transparency. The aim is to have these officials also act as independent monitors, to ensure that the model is running effectively and is well understood within pilot communities. This would further the CDOs' mandate, and thus represents a win–win for both local government and service providers.

In return for a scheduled O&M service, the WUC will agree to pay instalments on time for each quarterly service, provide the necessary space and time for repair works to be completed and coordinate the payment of water user fees among its community. Furthermore, WUCs will participate in monitoring and signing off on repair. In cases where WUCs fail to meet a reasonable standard of payment – our current assumption is that 60 per cent represents the threshold at which the model starts to break down both financially and from a behavioural norm standpoint – then the service provider should turn to the DWO for redress.

### *WUCs adopt new mobile money service and collect regular water fees*

As outlined above, the majority of water users (78 per cent) are able to pay, but refuse to do so because of fear of corruption and because they have not seen a return on their investments. The current system is reactionary, providing for repair, not maintenance; this causes significant delays in repair times, leading to reductions in access to safe water.

GU's current hypothesis is that if there exists a transparent system to save water user fees, more households will be willing to pay regularly. GU would work with an identified mobile money provider to introduce a banking system where WUCs will be able to securely save and manage water user fees from their mobile phones. The identified system would enable access to account-related information and financial transactions, such as transferring money from one account to another, as well as checking balances.

One such opportunity might already exist with Airtel to incentivize an expansion of their established Weza model. Airtel Weza is a digital financial solution that permits village savings and loans associations and other forms of savings groups – a WUC for example – to store their group's cash as mobile money. It works by having a group SIM (or wallet) that can be paid into. Three additional SIMs are then connected to this group (or wallet as it is referred to in the system). If anyone deposits into the wallet, the other three SIMs are notified of the transaction. Similarly for money to leave the account, the transaction initiated on the wallet SIM needs to be authorized by the other three SIMs each using a four digit PIN. The system includes the following features relevant to the model:

- *Group accounts*. A group wallet to safely store group funds as mobile money.
- *Record management (mini-statements)*. Mobile reports that can be generated to summarize transactions within a defined period.
- *Mobile banking*. The product can be linked to bank accounts at participating financial institutions to allow access to interest-bearing savings and credit

products. Credit will be dependent on the group's saving history, and loans can be disbursed and repaid from the group wallet.
- *Increased security.* Three separate authorization PINs held by three selected individuals. Notification SMSs on cash withdrawals to an additional five contacts.

In this case, Airtel agents would actively market their product with WUCs and introduce basic bookkeeping skills to register payments.

As outlined in the previous section, only a minority of WUCs had enough cash reserves currently to pay for an O&M service. GU's critical assumption is that once this system is in place, more households will be willing to contribute; thus WUCs will be able to build cash reserves. GU would monitor closely for this anticipated change, as if it does not occur there is unlikely to be any uptake in the O&M service contract model overall.

### *Government increases its influence in regulation and enforcement*

It is clear that local government do not have the funds to provide continued O&M services, yet they do have a mandate to promote health and private sector development in their districts. Their role in regulation of water services and enforcement for payment of water fees is significantly under-developed. Under this scheme, GU would work with the DWOs to harness their oversight of service contract terms and conditions, approve water fees, and mediate disputes between WUCs and service providers and monitor for quality of services.

In order to support a service contract model for O&M, communities need to be convinced of its benefits and have funds to pay for the service. Service providers would be responsible for marketing their services and progressively increasing the number of service contracts by providing a quality service. Critical to their success in doing this, however, would be local government willingness to use their significant influence to publicly support the service and enforce water fee payments; a system to enforce consequences for non-payment would be required. They would also play a critical role in ensuring that political interference is minimized and, as the provision of water is a public good, endorse the fee payment structure. As such, the DWOs' role in dispute resolution and quality assurance would be ongoing and reflects their current mandate.

## Conclusion

Over the past several decades, the development sector has understandably placed emphasis on expanding access to rural safe water. At least initially, the best way to expand access was to focus directly on the installation of new points. This strategy has proved successful in increasing coverage rates over a few short decades. However, when the full life-cycle costs of maintaining existing points are not taken into consideration, these investments can be significantly undermined.

This case study adds to the growing body of evidence that suggests the need for alternatives to community-based management models, which have become the

norm across sub-Saharan Africa and other parts of the developing world. These require emphasis on not only capacity building, but also changing incentives towards payment for maintenance as opposed to repair.

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