
Assessment of tools in use by the National Water and Sewerage Corporation to improve water and sanitation services to the slums of Kampala, Uganda

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Abstract: This paper presents the multi-faceted approach and tools used in the provision of water and sanitation services to the urban poor in Kampala, Uganda, together with their impacts and the challenges faced during their implementation. The tools include a variety of organisational, financial and technical instruments ranging from corporate strategy, a dedicated pro-poor branch and reduced connection fees to the installation of pre-paid water meters. Among the challenges faced include the diverging interests between the pro-poor branch and the commercial branches, limitations in identifying the poor, the high capital and recurrent cost of pre-paid water meters and the poor management of communal sanitary facilities. Key impacts include a significant rise in the number of pro-poor facilities and a considerable increase in access to water and sanitation services by the poor. Pro-poor initiatives and impacts are evident in water supply more than in sanitation and this calls for an increasing focus on pro-poor sanitation.

Keywords: water supply and sanitation; utilities; leading practices; services for the poor; organisational; financial and technical tools; Uganda.

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1 Introduction

As the world embarks on the SDG 2015 agenda, it is globally acknowledged that there has been progress in increasing access to improved drinking water sources and sanitation services. Since 1990, over two billion people have gained access to improved water sources and almost two billion people gained access to improved sanitation services (WHO/UNICEF, 2014). However, much as there has been progress, more than 700 million people and approximately 2.5 billion people still lack access to improved drinking water sources and sanitation services respectively (WHO/UNICEF, 2014). Nearly half of those without access to improved drinking water sources live in Sub-Saharan Africa with the majority being the poor and marginalised populations. Disparities exist between different social and cultural groups, the rich and the poor and between those in different geographical settings – the rural and urban areas. This article focuses on the latter with emphasis on the poor people living in slum areas.

In developing countries, the number of people living in cities and towns is growing rapidly owing to natural growth processes and rural to urban migration (Baker, 2008). It is estimated that by 2020, 50% of the developing world's population will be living in urban areas (Cross and Morel, 2005). In Sub-Saharan Africa approximately 70% of the existing urban population live in informal settlements (Moreno, 2003; Satterthwaite et al., 2005; Majale, 2008) mostly with inadequate access to basic services. Therefore, as the world looks forward to the sustainable development goals – post 2015 agenda, it is important that the low-income populations in urban areas are given increasing attention as well otherwise the set targets in reaching out to the unserved populations will not be reached (WUP and WSP, 2003).

The limited or lack of access to improved services within poor communities has been attributed to a number of factors. They include lack of priority especially for sanitation at different levels (Paterson et al., 2007), limited political support (WaterAid, 2008), limited funds for investments in infrastructure (Rheingans and Moe, 2006), lack of accountability, presence of vested interests by water vendors and public officials, dishonest utility staff, administrative and legal barriers such as the need to own land titles to get access to funds or a water connection, limited pro-poor capacity with the service providers, the lack of knowledge among the poor on legal and administrative requirements, absence of human resources and incentives required to provide services to the urban poor, inappropriate financial policies for example payment of monthly bills and high connection fees, tariffs that do not cover the full cost of efficient services (World Bank, 2009; Triche and McIntosh, 2009), limited space as well as physical and technical challenges that make extending water supply and sewerage networks into informal and unplanned settlements more difficult (Katukiza et al., 2010).

In Uganda's capital city – Kampala, more than 60% of the urban population reside in informal settlements which are characterised by low levels of access to basic water supply and sanitation services (Kulabako et al., 2010). This has left majority of the slum dwellers exposed to health related risks and has also attributed to the existing poor environmental conditions within the settlements (Van Vliet et al., 2010). Addressing the existing challenges requires developing mechanisms that respond to the context specific situation in slums. This study aims to explore specific approaches that National Water and Sewerage Corporation (NWSC) – a government parastatal with the mandate to operate and provide water and sewerage services in designated areas – has developed to improve water and sanitation services provision to the urban poor in Kampala. The specific objectives of the study are to

- 1 identify the pro-poor tools developed to enhance service provision
- 2 study the impact of the tools
- 3 identify the challenges faced during the implementation of the tools.

2 Theory

2.1 An overview of the situation of the urban poor

In the cities of the developing world, urbanisation has become virtually synonymous with slum formation. Van Vliet et al. (2010) indicate that in Sub-Saharan Africa, slum population is expected to reach 313 million in 2015 from the 101 million in 1990. Among other factors, the rapid expansion and densification of slums areas has been attributed to the absence of clear policies and effective programs to meet the needs of the poor (Cross and Morel, 2005). Though the urban poor are quite diverse across countries and within cities, regardless of their location, they are faced with several common characteristics (Baker, 2008). Among these include lack of access to adequate and affordable basic water supply and sanitation services, lack of adequate housing, limited or no access to other infrastructure and services such as solid waste, storm water drainage, roads and footpaths (WUP and WSP, 2003), vulnerability to risk such as environmental hazards and health risks, high density (Paterson et al., 2007) and lack of adequate subsistence income (Cross and Morel, 2005) among others.

The social and economic situations of the urban poor have been identified to be among the key factors that have resulted into low services coverage in slums. Cross and Morel (2005) indicates that provision of effective water and sanitation services in informal settlements presents a number of financial, technical and legal challenges to the water operator. Among these are fears of low cost recovery, difficulties involved in operation and maintenance of infrastructure, itinerant slum population, uncontrolled development, congestion, unclear land tenure arrangements, absentee landlords as well as difficulties in employing conventional management instruments.

WUP and WSP (2003) note that while some utilities have made an effort to provide basic services, these services are often unreliable and or inaccessible. This is a result of intermittent water supply, frequent breakdown, inefficient operations, poor maintenance and depleted finance (Corel and Morel, 2005) among others. Therefore, as concerted or proactive efforts are being undertaken to identify and implement appropriate mechanisms

(WUP and WSP, 2003; Sheuya, 2008; Van Vliet et al., 2010) to address context specific slum dynamics, it is equally important that the capacity of service providers is enhanced to meet the growing demands so as to ensure sustainable services.

2.2 Addressing water and sanitation needs in informal settlements

Interventions in informal settlements need a more coherent and strategic focus in order to maximise long-term impact and ensure efficient use of resources (AWSB and NCWSC, 2009). Unless appropriate strategies are developed to cater for the urban poor, access to safe drinking water and adequate sanitation is likely to worsen (Kimani-Murage and Ngindu, 2007). To be in position to develop appropriate mechanisms, there is need to improve our knowledge about the urban poor (Tova et al., 1993). As Cross and Morel (2005) and Baker (2008) note, quite a number of water utilities do not have data about the poor and lack information on the specific challenges they face as well as their preferences. Adequate response to the urban poor's challenges requires a good understanding of who the poor are and establishing reflective approaches that facilitate and encourage working with the existing settlements (Evans, 2007).

In response to the existing challenges, Triche and McIntosh (2009) suggests some measures that can be undertaken in addressing some of the challenges encountered. Among these include giving the poor a voice, neutralising vested interests, eliminating administrative barriers, strengthening the capacity of service providers and promoting meaningful participation in planning where the community is also involved. Additionally, Cross and Morel (2005) present some of the key entry points in enhancing pro-poor services and among these include, the need to develop pro-poor tariffs and financing mechanisms for service improvement, institutional arrangements to improve services to the urban poor, advocacy and communication regarding the poor, consumer voice and civil society engagement.

Besides the above mentioned approaches (Muller et al., 2008; Velleman, 2010) indicate that utilities need to also incorporate the social accountability mechanism in their planning and operational practices, so as to gain or increase users' trust and also improve their performance. Muller et al. (2008) presents a broad range of accountability tools that utilities can consider and among these include the *on-demand provision of information tool*. Provision of for example technical information governing practical issues such tariff charges builds trust between users and utilities. That aside, this principle that Velleman (2010) defines as *transparency*, increases the ability of users to make informed decisions about water services. Therefore, the availability and accessibility of information as well as transparency of practices play an important role in increasing downward accountability and creating a strong foundation for successful partnership.

Therefore, to ensure adequate and quality service levels, implementing systems that acknowledge the needs, preferences and capacities of poor communities and enhance users' trust, requires financial and organisational or managerial efficiencies as pre-requisites for pro-poor functioning among other measures (Velleman, 2009).

Blokland (2011) suggests that successful approaches for pro-poor services provision are conditioned by four perspectives that are not fully in the hands of the service provider:

- 1 policies, arrangements and capacities: ensuring political support; removing administrative and legal barriers; addressing pro-poor capacity issues with the service provider; sourcing funds for investment in pro-poor water and sanitation infrastructure
- 2 collaboration: establishing an approach that acknowledges the needs, preferences and capacities of poor communities, that promotes interaction with the poor, removes their knowledge gaps and ensures their engagement; acknowledging and addressing the vested interests of water vendors, public officials and utility staff
- 3 tools: developing tools to map the urban poor; establishing pro-poor incentive systems; developing suitable financial instruments; introducing appropriate water and sanitation technologies
- 4 sustainability: ensuring innovation and learning.

Whilst the present paper is primarily on the tools that were developed and applied by NWSC, the hypothesis is that not only are the tools to be in place, but also they need to be integrated in a broader approach that includes the other perspectives.

2.3 Research methodology

To generate insights on service delivery tools, their integral application and impacts on services delivery and challenges faced, semi-structured interviews were conducted with staff from NWSC particularly focusing on those dealing with pro-poor activities. These semi-structured interviews were administered to purposively selected respondents. To triangulate and have an overview of the water and sanitation situation, the observation method was used in two areas (Kisenyi and Bwaise) which are mapped as informal settlements. Secondary data sources were also reviewed to have a broader understanding of water and sanitation contextual situations.

3 Research findings and discussion

This section presents the different pro-poor tools used by NWSC. These are distinguished in organisational tools, the mapping tool, connection fee and tariff related tools, water and sanitation technology tools. The challenges that have been encountered in the implementation of the tools are also presented here.

3.1 Organisational tools

3.1.1 Corporate strategy

In order to establish sustainable strategies to ensure continued provision of water and sanitation services, since 1997, NWSC developed a policy of a three-year corporate plan, which sets out the targets to be achieved within the specified planning period and strategies to ensure that the desired targets are met. This is followed by an evaluation at the end of the planning period. Strategies to establish a framework to extend water and sanitation services to the urban poor were adopted during the corporate plan of 2003–2006.

To begin with, the development of a corporate strategy that clearly focuses on serving the poor which the World Bank (2009) also recommends, laid a good foundation for the development of pro-poor tools. The strategy enabled NWSC to identify and deal with the key technical, social, cultural, commercial and managerial challenges of pro-poor services provision. The subsequent definition of objectives, setting of targets and development of approaches and tools enabled the development of a framework for monitoring and evaluation that guided the implementation of the pro-poor strategy and the identification of associated challenges and ways to address these.

In terms of determining the effectiveness of the pro-poor strategy, one shortcoming is that not in all cases the actual impact of a given approach or tool on the urban poor can be easily established as the results do not single out poor customers, for example in the case of the new connection fee as explained in the concerned section. Another issue is that, much as the set tariff has adequately increased the urban poor's access to water services, the poorest of the poor remain locked-out because for them even the pre-paid meter charges are unaffordable. This group requires special attention if the aim of extending basic services to all has to be reached. Overall, despite these shortcomings, the presence of a strategy provided a solid base upon which to monitor, evaluate and improve the approaches.

3.1.2 Multi-stakeholder collaboration

The adequate and sustainable provision of services provision to the poor requires the development of enabling and inclusive multi-stakeholder approaches. These approaches that by definition have a long term perspective would foster cooperation and collaboration of various parties including among others national and local governments and their agencies, service providers, the slum dwellers and other stakeholders in the informal settlements. For example, the issue of damage or demolition of established infrastructure that results from *slum re-development* indicates the need to better regulate the slum environment failing which private investors are likely to continue hampering services provision and causing financial losses to the service provider. Since this is not within the powers of NWSC, collaboration with the concerned national Ministry and Kampala City Council Authority is required to develop and implement policy and regulation that directs land use dynamics in informal settlements in an effort to create an environment for orderly and secure development.

The implementation of provider-side social accountability has improved NWSC's capacity to serve the poor. Transparency in service delivery has enabled NWSC to show its social accountability to the users. As noted by Velleman (2010), social accountability increases users' trust in the provider and creates a foundation for partnership. This increases customers' willingness to engage with and pay for water services. Therefore, through provision of information and practical demonstration to the customers that water can be purchased at the set official tariff, NWSC has much improved its relationship with the slum dwellers. The availability of information and the transparency of practices have helped to transform the users' negative attitude towards the utility whilst also enhancing their capacity to demand for services and their willingness to pay for them.

With the current rate of urbanisation and the pace of economic development, it is inevitable that the number of the urban slum dwellers will significantly increase, for at least a decade before it will start to fall as a result of increasing prosperity. Government should recognise this and take significant steps in defining and reaching out to the poor.

From the present situation where the poor get served based on incidental political action and or project support that absorbs otherwise unaffordable financial outlays, one needs to develop a structured framework that provides a permanent and solid basis to expand water and sanitation services to the poor. The formal incorporation of the urban poor within the institutional framework would contribute to the development of a structured approach that would enable and ensure continued financial and institutional support. Van Vliet et al. (2010) note that, in the absence of formal governmental intervention and the unplanned nature within slums areas, calls for a dedicated management arrangement as well as governmental policies to promote orderly development (Murungi and van Dijk, 2014), are necessary. Given its experience in working with the informal settlements and being a well-recognised public entity, NWSC could play a key role in “voicing the need to institutionally incorporate the poor” within the collaborative arrangement.

3.1.3 The PPB

As a move towards services provision to the poor, NWSC temporarily established a pro-poor branch (PPB) in the centrally located Kisenyi Parish. The branch undertakes the day-to-day activities in providing innovative water and sanitation services to the urban poor. For example, it is the PPB that implements, operates and collects revenues from the pre-paid water meter projects that are an alternative to the conventional vendor-operated water kiosks and Public Stand Posts that are installed and operated by NWSC’s regular commercial branches. The PPB focuses on the population that live in the 25 informal settlements across Kampala. The water services in Kampala are operated by 14 regular commercial branches and the PPB assists these branches with the provision of services to the slum dwellers that reside within their service areas. The PPB has a limited number of staff who undertake different tasks and responsibilities. They include the branch manager, the commercial officer, the information and technology officer, the cashier, the financial officer, the branch engineer and support staff like the surveyors and plumbers. The establishment of the PPB has made NWSC more visible to the urban poor and has improved its relationship with the urban poor communities thus, improving its capacity to deliver improved services to the slum dwellers. The PPB is meant to be a temporary structure and in the long run its work is expected to be internalised within the corporation through standard operating procedures (SOPs) and be carried out by the regular commercial branches.

Despite the acknowledged contribution towards improving accessibility to pro-poor services, the current limited human capacity and its location among other aspects have been identified as bottlenecks towards expanded and sustained services provision. The PPB is centrally located and has only 12 staff. Apart from these few staff members attending to a large population of slum dwellers, they also have to travel long distances to interact with this target group, install the prepaid water meters and offer operation and maintenance services. These activities are sometimes constrained by limited transport facilities.

That aside, much as the commercial branches are expected to take over the provision of pro-poor services, there is a degree of animosity caused by diverging social and commercial insights between the PPB and the commercial branches. For example, when deciding on making new connections, commercial branches mostly favour to connect affluent customers that pay higher rates than the poor that use kiosks, PSPs or pre-paid water meters. Also, where the revenue from conventional kiosks and PSPs accrues to the

commercial branches, the revenue from the pre-paid meters goes to the PPB, meaning that the installation of a 'competing' pre-paid meter actually negatively impacts on branch revenues. In addition, with the pre-paid water meter being a cheaper alternative for them, customers will no longer exert pressure on the vendors to clear their bills or settle their arrears. This leads to a further reduction in revenues thus affecting the commercial performance of regular branches, which will in turn negatively affect their incentive package. Therefore in slums like Bwaise, pre-paid meters have not been welcomed since they are seen to (potentially) constrain the commercial branches in reaching their performance targets. Even then, the revenue collected from pre-paid meters equals to approximately UGX 55 million per month (US\$12,500) only. This is a small amount compared to that collected from other customers. The limited revenue also helps to explain the lack or limited focus of commercial branches on pro-poor connections.

The pre-paid water meters that are promoted through the PPB are not commercially viable and for that reason are sourced primarily from dedicated donor-funded pro-poor projects. Since the PPB mostly operates on these project budgets, this raises questions about the sustainability of the unit and its innovative capacity in the case of dwindling funds. The perception that the PPB is serving a dedicated group of customers through technologies and approaches that are not commercially viable, limits the desired upscaling of innovative pro-poor service provision systems.

The development of a dedicated unit – the PPB with an exclusive task to pilot and establish innovative water and sanitation services in the slums has improved NWSC's focus on the poor as World Bank (2009) notes. It has enabled the organisation to better understand the urban poor as a result of its day-to-day interaction with the communities and has improved its relation with the urban poor. The PPB has given the slum dwellers an opportunity and the comfort to easily seek for assistance and or information on service provision from dedicated PPB staff many of whom have social science background or related relevant experience. The slum dwellers can more easily express their opinions since they feel that this is *our point of reference – it is specifically established to serve the slum dwellers*, thus reducing the uneasiness they would feel if they were to go to branch offices which handles all (and 'more important') customers.

The knowledge and experience that NWSC has acquired so far through the PPB, has given it a good understanding of the socio-economic dynamics of the poor and has enabled it to develop a set of approaches and tools that will allow it to scale up the pro-poor efforts whenever the opportunity arises.

The discussion around the continued existence of the PPB is a very interesting one. One position is that the unit is there to stay for as long as there are slums. The other position is that the PPB is necessary to develop and test new approaches and tools and that the unit becomes superfluous once these can be mainstreamed. Whatever may be the case, at some point the services now offered by the PPB will be taken up by the commercial branches. This would resolve the current limitations resulting from limited staff capacity and the central location of the PPB. However, for this transition to take place without disruptive effects both the branches and the communities will need to be prepared. Apart from defining their pro-poor roles and responsibilities, some dedicated capacity development of the branches and their staff would be required.

3.1.4 Incentives

Two types of incentives will be discussed: output-based aid (OBA) and performance contracts. NWSC had external incentives provided by the World Bank in the OBA project. The World Bank provided the incentive based on output achieved, that is – functioning pre-paid water meters established at appropriate locations. An independent agent verifies NWSC's performance and based on the outcome from the verification, NWSC is reimbursed its expenses. In cases where the performance does not meet the agreed targets, then the initial costs would not be reimbursed. Clearly, with this system the service provider bears a risk rather than the donor.

NWSC also signed a performance contract with the GoU whereby, among the set variables included meeting the defined water target for the urban poor. Under this contract, the government provided a reward or penalty based on the performance in relation to the set targets. The 'incentive formula for NWSC-Uganda/Government Contract (2009–2012)' includes 13 performance areas that each have their own weightage. The Corporation has cascaded this contract by introducing a performance-based incentive scheme that is applied to individual systems, branches and teams, and that contains the following variables:

$$\text{reward (or penalty)} = 12\% \times \text{AGS} \times (\text{CAS} - 1)$$

where AGS is the annual gross salary and CAS is the composite aggregate score that expresses actual performance relative to the agreed target.

$$\begin{aligned} \text{CAS} = & 0.05X_{RCE} + 0.125X_{WS} + 0.075X_{RCD} + 0.10X_{CW} \\ & + 0.05X_{NRW-KW} + 0.1X_{NRW-OA} + 0.05X_{NSC} \\ & + 0.125X_{NWC} + 0.075X_{WCP} + 0.1X_{PAR} \\ & + 0.05X_{EDC} + 0.05X_{CSI} + 0.05X_{WQ} \end{aligned}$$

whereby X_{WCP} , is the parameter concerned with the number of new water connections for the urban poor with a weightage of 7.5% in the calculation of the CAS. If the actual performance equals the agreed base performance target (BPT) then X_{WCP} equals 1; if actual performance exceeds the BPT, then X_{WCP} is bigger than 1, etc... If performance on all factors equals the concerned BPT, the resulting value of CAS will be 1 and no incentive will result. In this way, depending on the calculated value of CAS, a maximum penalty of –12% and a maximum reward of +12% relative to Gross Salary may result for failing to achieve or for achieving the targets respectively.

In as much as the OBA approach pushes for full completion of a pre-paid water meter project, its implementation is affected by the difficulties NWSC faces in mobilising investment funds. The pre-financing constraint is also amplified by the long time lapse between up-front investment and reimbursement. Apart from that, in some cases after completion of activities disputes may arise between the verifying agent and NWSC. For example, the agent may claim that a facility has been constructed at or too close to the residence of a rich person, which is contrary to the contract that targets the poor. The verifying agent may then refuse to approve payment for this particular facility.

The challenge with the pro-poor component of the performance contract with the GoU and the related internal incentive system is that the rewards are only given for new connections for the poor and not for the sustained operation of the service.

The incentive systems provided by the World Bank through the OBA projects and by the GoU, have encouraged NWSC to provide pre-paid meters to improve water services provision to the urban poor. As noted by Mumssen and Kenny (2007), OBA encourages service providers to improve performance as it requires accountability on outputs rather than on inputs. The OBA approach focuses on the monitoring of visible and quantifiable outputs as Mumssen and Kenny (2007) notes. However, the financial limitation faced by NWSC in pre-financing the investments, is seen to delay or slow down the upscaling of the pre-paid water meter program. One wonders if the provision of *partial or conditional* pre-financing would be an option for the donor to explore. This could possibly minimise the present constraints and speed up processes involved in the rate of service provision expansion.

The contract with the Government of Uganda and the related incentive system operated by NWSC contain a component that rewards service connections to the poor. However, the only factor considered is the number of new service connections for the poor, and also the relative weight of this component is only 7.5%. The incentive system could be reviewed and amended to emphasise the importance of service provision to the poor. This could be by increasing the relative weight of the pro-poor parameter and or by introducing an additional parameter that expresses the *functionality* of the pro-poor infrastructure. Developing and incorporating these changes in the performance assessment of the commercial branches will contribute towards improving the focus of these branches on pro-poor services provision.

3.2 Mapping the poor

In order to identify existing informal settlements, NWSC used the following characteristics to define the urban poor:

- 1 households with incomes less than UGX 80,000 per month (approx. US\$31) and in most cases earned on a day to day basis
- 2 tenants living in houses with a floor area less than 40 square metres
- 3 a water consumption of less than 20 litres per capita per day
- 4 people who do not have a house connection and mainly use public water points.

An area is considered an informal settlement or slum if the large majority of its population are characterised as poor.

Mapping requires to first identify locations or ‘pockets’ that are accommodating poor populations and then within those specific ‘pockets’, define or classify the poor individuals. The heterogeneous and transient nature of populations in the slums makes the identification and demarcation of a slum as target area for pro-poor services provision quite a challenge. For example, Kisenyi that was ranked as a slum during the original survey in 2007, is rapidly changing into an area with university hostels. Apart from social transition, this change also causes damage to or even demolition of existing infrastructure thus presenting a direct loss to the service provider.

In addition, even if the people have been well categorised (as poor or rich), there are cases where non-eligible people obtain tokens and get water from pre-paid meters thus abandoning their house connections. That aside, the mapping exercise creates

expectations among slum dwellers and this in a way puts pressure on the corporation when these expectations are not met.

Financially, mapping is an expensive exercise, given the fact that it has to be accompanied by field observations. Additionally, the transient nature of slum dwellers and the changing nature of slums where these are growing rather rapidly, render mapping results outdated in a short time thus requiring periodic mapping to keep up with the current status. This further increases mapping costs.

Despite the challenges faced in undertaking the mapping exercise, it is worth noting that identifying and mapping the poor is of great importance given its direction towards prioritising the needy and planning specific-based needs approaches (Agarwal and Taneja, 2005). By mapping the poor, a utility is in position to improve its knowledge about the poor and have prior in-depth understanding of the expected difficulties in service provision upon which, reflective measures are developed and implemented.

3.3 Financial tools related to the tariff

3.3.1 Affordable basic water tool

This tool aims at ensuring that no one is denied access to water irrespective of the financial status. The proper application of the affordable basic water tool called for the need to conduct an affordability study before any tariff was set. This helped to know people's income and expenditure patterns and thus provided guidance for defining the tariff that the urban poor could afford. Underlying this was the recognition that supply of water at a 'basic-level' would assist in alleviating poverty and improving community health. This study resulted in the establishment of a tariff that allows the urban poor to acquire their basic water needs at an affordable cost. The set price is UGX 25 (US\$0.01) for 20 litres of drinking water drawn from a pre-paid water meter.

3.3.2 The pre-paid billing tool

The system of providing water on credit and issuing bills at the end of every month was revised. Conventional billing is based on the logic of providing a service on credit and when the month ends, a bill is issued to the customer. This system favours salaried income earners but 'locks out' daily income earners who might not have cash at month end. Therefore, to cater for the urban poor whose income is mostly earned on a daily basis, a pre-paid water system was introduced whereby one pays for the service before use. The water thus paid for is registered in the form of a credit on a token that is inserted in a pre-paid water meter to draw water. This system only applies to the pre-paid water meters.

3.3.3 The cross subsidy tariff tool

In ensuring that the urban poor get access to basic water needed, NWSC defined different tariff charges for the different customers. A person using water for basic needs is charged much less than one using water for commercial or business purposes. A lifeline tariff was set for people using water for basic needs and one paid UGX 1,323 (US\$0.50) per cubic meter. This tariff applies to the urban poor when using pre-paid water meters and to water vendors that sell water from public stand posts. The people using water for commercial

purposes pay approximately UGX 3,089 (US\$1.17) per cubic metre. In this way the commercial customers subsidise the poor.

The cross-subsidy tool and the affordable basic water tool go hand in hand in a sense that, the application of the cross-subsidy principle paves the way for the Affordable Basic Water tool since water provided through public stand posts and pre-paid water meters is available at a lower price. The cross-subsidy tariff tool is based on the concept that the rich subsidise the poor and that larger, wealthier towns pay for the financial shortcomings of the smaller, poorer towns. However, the recent addition of 42 towns (which are predominantly small and poor) to the mandate of NWSC which previously served only 23 towns, may stretch this cross-subsidisation concept. As these small towns are being added, the need to fund an increasing number of poor customers from a near stable number of more affluent customers may well challenge the sustainability of the cross-subsidy concept.

Another challenge concerns the customers who buy water from vendor-operated PSPs or those who do not have individual tokens to draw water from the pre-paid meter. Even though the vendors pay the basic tariff to NWSC, the clients pay a surcharge to the vendor and this renders the service expensive. This issue is aggravated by the fact that the price for water bought from vendor-operated PSPs is not regulated nor are the vendors. In the past, efforts were undertaken to license vendors; however these were unsuccessful. Likewise, some clients do not have their own token for the pre-paid meter and need to use another person's token for which an extra fee is paid. Finally, the limited availability of smallest denomination (UGX 50 cents) presents a problem in view of the basic charge of UGX 25 for a 20-litre bucket. In the end it is only the poor that have personalised tokens that are fully benefiting from the basic tariff.

3.4 Financial tools related to the connection charges

3.4.1 The New connection fee tool

Prior to the implementation of the pro-poor policies, a person was required to pay UGX 150,000 (about US\$58) connection fee, and possess a land title in order to be connected to the water system. These requirements favoured high-income earners and those that owned land and limited new connections in informal settlements where most of the slum dwellers do not own land and cannot afford the amount required.

After realising that these requirements limited access to water by the poor, a *new connection fee* policy was established. Now people pay only UGX 105,000 (about US\$41) for a new connection and the possession of land title is no longer a requirement. In the case of OBA and presidential projects the connection fee is reduced even further and the urban poor pay UGX 60,000 (about US\$23) and UGX 30,000 (about US\$12) respectively for a new connection.

Under the *new connection materials subsidy tool*, NWSC provides the connection materials within the first 50 meters for free and the customer only pays for the extra distance. The new connection fee tool which lowers the connection cost considerably and the material subsidy tool which provides free connection materials for the first 50 m and 60 m for water and sewerage services respectively, have motivated people to get connections thereby contributing to improved access to services. However, these tools are not specifically pro-poor as they apply to all customers. Establishing their actual effect on

the poor is in fact not easy since there is no registration of the beneficiaries in terms of them being poor or regular customers.

Secondly, slum dwellers are often far away from the water or sewer lines. Even if the materials are free for the first 50 m or 60 m, the remaining length and related materials charges are too high for the poor thus limiting them to benefit from the material subsidy tool. To address this challenge, a new policy is being prepared that aims at promoting network density. This will bring the network closer to potential (poor) customers and thus enable the effective implementation of the new connection materials subsidy.

On the administrative side, to fill the financial gap resulting from the provision of free materials and the reduced connection fees, a ring-fenced fund was established. A surcharge was added to the regular tariff and the extra revenue thus collected is paid into this fund. However, some of the challenges being faced include the inability of some areas to contribute to the fund and secondly, the inadequate earmarking of the fund leading to diversion of the resources to other uses. That aside, the provision of material subsidy for all interested customers is being seen as a drain on the corporation's resources. In some cases demand for new connections outstrips the availability of materials. As one of the respondents stated, at one time no water meters were available for a period of 6 months.

Additionally, it is important to note that the connection fee related tools do not apply to pre-paid meters since the installation of pre-paid meters is not paid for by the customers. As such, pre-paid meters do not generate any new connection related revenue. Their provision is exclusively project-based [for example, from KfW, OBA (WB), AfDB, Belgium and Coca Cola Foundation].

3.5 Pro-poor technology tools for water services

NWSC embarked on installing pre-paid meter systems that suit the earning patterns of the urban poor. Before installation, processes like identification of sites to install the water supply systems and surveying are conducted. For the identification of sites NWSC fields community mobilisers to map the poor. These are supported by local government structures such as the village councils who help in identifying or recommending potential beneficiaries. After site identification, a technical survey is done to establish the distance from the intended location for the pre-paid meter to an existing line that can be tapped. This is followed by a final survey to ensure that the new connection is shown on the block map for further monitoring. When survey work is completed, pre-paid meter systems are installed. Water can be drawn from the pre-paid meter system by means of a token that is charged with credit. NWSC uses pre-paid water meters from two suppliers and each supplier comes with its own tokens and related management systems.

Comparing both systems (here called system 1 and system 2) it is seen that with the first system there are more steps to be taken and multiple staff to be involved before the token can be issued and credited. In the case of system 2 one person performs all the duties. With the latter, in case of an error, a token can easily be recovered by re-programming whereas with the first system, at the time of research, the only option available was token replacement. Tokens programmed using system 2 are more informative as they display tariff structure, amount of money loaded and used as well as litres dispensed thus making it easier for the customers to monitor their usage. With system 1, usage display only captures litres of water dispensed and amount of money on the token thus making it less informative. Additionally, with system 2 the tokens used are

metallic thus rendering them more durable compared to system 1 whose tokens are plastic. Despite the differences, implementing a system where the beneficiaries are able to track consumption, has improved NWSC's level of accountability to its customers. This has resulted into more trust and improved working relations.

The pre-paid system consists of two types of tools that is the pre-paid water meter technology and the pre-paid billing system. Each has its challenges. To begin with, the pre-paid water meters are expensive to install. It costs between US\$500 and 1,000 to install compared to only US\$20 for a regular public stand post. In addition, whilst providing the tokens free of charge as a way to encourage the use of the pre-paid meters, NWSC pays US\$12 for each token. Adding to the high cost of its installation and the tokens, the spares for the pre-paid meter are expensive thus resulting in high operation and maintenance costs. Furthermore, the spares are not readily available in the market leading to extreme dependence on the two suppliers. Moreover, financial limitations resulting in a lack of regular budget to maintain a stock of (expensive) pre-paid meter spares, coupled with lengthy internal procurement procedures, leads to supply interruptions with downtimes of up to six months. Finally, delayed payments to suppliers for the delivered spares leads to new delays in supplying fresh orders. All together and despite the low water price, these challenges threaten the continuity of supply and reduce customers' confidence in the technology.

The challenges associated with the billing system include the following. The different suppliers provide different hardware together with different tokens thereby presenting technological differences and rendering the systems non-compatible. This means that a client with a token from supplier 1 cannot draw water from a pre-paid meter provided by supplier 2 since the meter will not accept the token. That aside, credit can be bought at the PPB office and from private credit vendors at the basic tariff of UGX 25 for 20 litres. The vendors retain a fixed percentage on their sales. For the vendors to charge their credit vending machines, they have to first make a payment to the NWSC account in the bank. With proof of that payment, they then proceed to upload credit on their machines at NWSC, but only at the PPB office. After this they can sell credit to customers. This process has been recognised as lengthy and frustrating especially if the vendors are far from the PPB office. This negatively affects the vendors' motivation and in the end the customers may suffer as they will not be able to draw water in case their tokens run out of credit. The technical and administrative hitches associated with the pre-paid meter system may push the customers to demand for more reliable albeit more expensive PSPs and Kiosks.

3.6 Integral application of the tools related to drinking water supply

The joint application of a number of financial and technical tools developed has enabled NWSC to develop an integrated approach to the provision of services to the urban poor. The financial mechanisms and institutional arrangements that Cross and Morel (2005) and Velleman (2009) identify as well as measures like giving the poor a voice, neutralising vested interests and elimination of administrative barriers that Triche and McIntosh (2009) recognise among others, have been put in place by NWSC. At the delivery side of the water system, the pre-paid meters and the related credit system presents a system that works well for the utility and for the poor. It provides NWSC with a steady cash flow and removes the risks of debts and arrears. It also improves the

chances for sustainable operation of the network. The poor have good and continuous access to affordable water supply for as long as there is no breakdown or if so, repair or replacement is undertaken within a reasonable time frame. Additionally, clients can accumulate credit on their tokens when cash is available and spend this credit during 'harder days'.

The technological challenges with the pre-paid meter system need to be overcome to promote and sustain the success of this technology. As identified by Isoke and van Dijk (2013), a bigger percentage of the urban poor in Bwaise and Kisenyi slums seem to prefer the PSPs over the pre-paid meter on account of the higher reliability of the PSPs and despite the higher price charged at the PSPs. The initial cost of installing a pre-paid meter is too high and spare parts need to become less expensive and more readily available. Manufacturers, distributors and water operators could jointly explore these for the common benefit of increasing the number of operational units that would in turn help to upscale the use of this technology. Taking up this challenge requires adequate time to plan, get the different actors on board, carry out research, pilot new approaches and finalise a cheaper, more reliable and uniform system. If there is desire to serve the poor sustainably, these more inclusive and reflective approaches need to be given attention in view of their potential merits (Evans, 2007).

3.7 Pro-poor technology tools for sanitation services

3.7.1 Extension of pro-poor sewerage services

In response to a call by government, NWSC undertook activities to extend the sewerage network to serve the urban poor. Identification of areas within the slums where sewer lines could be laid was done. NWSC is presently undertaking studies to develop an appropriate and affordable sanitation tariff for the poor. Another option being investigated is a sanitation levy whereby the water bill for any customer is proportionally increased with a sanitation charge, the proceeds of which are directly utilised towards providing piped sanitation services to the urban poor. Therefore, much as there is no implementation yet, plans are underway to extend piped sanitation to the urban poor.

3.7.2 Provision of non-piped household sanitation services

In areas where sewers cannot be provided owing to limited space or long distance to the sewer network, sludge removal services need to be provided for emptying septic tanks and cesspits. At the time of research, NWSC was undertaking a pilot study to determine the feasibility of using UgaVac – a sludge emptying device.

3.7.3 Communal sanitation services

NWSC, Kampala Integrated Environmental Planning and Management Project (KIEMP) under Kampala City Council Authority (KCCA), CONCERN NGO and other organisations, have constructed communal sanitation facilities for the urban poor. To ensure smooth running of the process, the following activities were conducted.

Identification of construction sites was one of the major activities undertaken. In order to acquire land, a demand-driven approach was used. Service providers held community meetings with the help of community mobilisers and or leaders. The meetings aimed at sensitising the community to help them understand that there was a problem that

required attention and at initiating negotiation processes for land provision. The service provider clearly indicated that there was adequate financial support but the only problem was lack of space. This called for negotiations with property owners who after agreed terms of use provided land for construction.

After construction, community leaders helped in the identification of a user committee and a caretaker that could oversee and manage the communal sanitation facility respectively. Jointly, they have to ensure that the facilities are kept clean and that tanks and pits are emptied whenever necessary. In determining the prices to be paid to use the public facility, a community meeting was conducted and a decision taken with the involvement and agreement of end users. People using the facility for either a long or short call, pay UGX 100 (US\$0.04), those using showers pay UGX 200 (US\$0.08), whilst the elderly and the young do not pay but then have to bring their own toilet paper. Important to note is that the stated fees give an overview of what is charged. The fees vary from place to place and since there is no regulation on the fees charged, in some cases forces of demand and supply determine the price. Different payment modalities exist. Some households pay on a monthly basis while others pay per use.

3.7.4 Challenges with pro-poor sanitation services

Looking at emptying of septic tanks and cesspits, the services offered by the private operators appear to be successful however the prohibitively high prices render the services unaffordable for the poor. Unfortunately, like in the case of the private water vendors, there is no regulatory mechanism in place to control the price charged by the pit emptiers. In addition, much as it is mandatory for the cesspit emptiers to dispose sludge at designated points, the lack of monitoring by KCCA creates an opportunity for the operators to discharge sludge in open spaces thus contributing to the pollution of the environment.

In recognition of the fact that within the slums some pit latrines could not be accessed by regular cesspit emptying trucks, a dedicated device (the UgaVac) was designed to offer emptying services in congested areas. A pilot was carried out and much as it was found that the device could reach congested places, it also failed to reach some locations thus rendering the technology questionable and limited in its applicability. Secondly, the continued use of the UgaVac in places where it could operate, was constrained by the fact that the supplier did not train the operators on its full usage. This has left NWSC with a number of unused devices.

The management of communal sanitation facilities is another challenge. These are operated by a community caretaker who is contracted and supervised by a local user committee. Monitoring is done based on a specific terms of reference and the aspects being monitored include usage, cleanliness and adherence to the set prices and standards. The proper maintenance of communal facilities is negatively affected by a number of factors among which alleged collusion between caretaker and user committee at the expense of both service price and quality.

The proper management of communal sanitation facilities is also seen to be limited by the insufficient cooperation amongst the key initiating actors (KIEMP, KCCA, CONCERN and others). One of the respondents identified the need to develop, implement and enforce a memorandum of understanding (MoU) to encourage their cooperation and identify and allocate responsibilities and activities to the various actors.

3.7.5 Discussion on sanitation tools

The provision of communal toilets has contributed to improved management of human wastes within the informal settlements. However, much as communal facilities are seen as the most viable option for sanitation in slums (Schouten and Mathenge, 2010), the challenges associated with their operation and maintenance leave the users dissatisfied with the services provided (Tumwebaze et al., 2013). This calls for the need to create an enabling environment that facilitates proper sludge removal and adequate management processes. Emptying charges need to be regulated (Murungi and van Dijk, 2014) to ensure that the services become affordable. Besides, there is need to develop and implement a framework where the roles and responsibilities of the caretaker and the committee are clearly stipulated and how the collected money should be managed. This could help to address the existing collision and the poor financial practices where revenues end up being misused.

Given the fact that the user committee might not have enough capacity to develop and implement an adequate governance and management system, the organisation providing the facility should work together with the user committee to assist with the development of the system and to mentor the members when implementing it. One of the ways to minimise the misuse of funds is to open up a bank account with different signatories where collections can be saved and only withdrawn when there is need to finance the maintenance of the facility. During the development of the framework, it is important to define who and after which period should the collections be deposited and how the deposit receipts should be managed. As van Dijk et al. (2014) notes, record keeping on collections and expenses should be emphasised to ease monitoring, evaluation and accountability. Setting up such a formalised structure, requires adequate time for planning and ensuring that the different actors involved reach an agreement on the decisions taken. However, we will argue that, for this approach to be successful, there is need to identify an actor that should take the lead in ensuring that the framework is developed and satisfactorily implemented.

The framework should also clearly indicate what needs to be done and or who should be approached in case performance gaps are identified and or in situations beyond the powers of the committee. This could then involve other actors like KCCA given its mandate on sanitation issues within the city. The involvement of different actors is greatly dependent on their willingness and readiness to take up the existing challenges.

4 Impacts of pro-poor tools

The implementation of pro-poor tools has had impacts on both the slum dwellers and the company. The poor and especially those using the pre-paid system became more conscious of their water use when they realised that any wastage results in an early return to the source and with that an unnecessary depletion of credited quantity of water on the token. On the side of the utility, the analysis on people's economic status, the implementation of an affordable tariff and the introduction of the pre-paid meters, improved NWSC's performance and reduced vandalism and water theft.

Table 1 Impact of the pro-poor tools

<i>Parameter</i>	<i>Unit</i>	<i>Kampala</i>	
		<i>2003</i>	<i>2013</i>
<i>Demography</i>			
Estimated population of Kampala	Number	1,208,544	1,788,600
Estimated slum population	Number	725,000	1,075,000
Number of informal settlements identified by NWSC	Number	n.a.	25
<i>Service connections</i>			
Service connections (water)	Number	87,172	317,292
Number of new water connections/annum	Number/year	11,548	21,637
Service connections (sewerage)	Number	9,499	17,888
Number of new sewer connections/annum	Number/year	104	235
<i>Pro-poor services</i>			
Public stand posts (PSP) and kiosks	Number	2,615	8,717
New PSPs and kiosks per annum	Number	277	95
Estimated population served by PSPs and kiosks	Number	300,725	653,820
Prepaid water meters	Number	0	1,613
New pre-paid water meters per annum	Number/year	0	781
Estimated population served by pre-paid water meters	Number	0	250,000
Community sanitation facilities (CSFs)	Number	n.a.	125
New CSFs per annum	Number/year	n.a.	56
Estimated population served by CSFs	Number	n.a.	12,500
<i>Quantities of water and wastewater</i>			
Volume of water sold	Million m ³ /yr	31.2	56.7
Volume of water sold at PSPs and Kiosks	Million m ³ /yr	1.5	2.8
Volume of water sold at pre-paid water meters	m ³ /year	0	43,862
Volume of sewage collected	m ³ /year	4,446,947	6,747,481
Volume of sewage collected from CSFs	m ³ /year	n.a.	n.a.

Notes: The number of new prepaid meters and CSFs for 2013 is high and relates to a pro-poor project.

The estimated population served by PSPs is for all NWSC operational areas within the country.

Source: All data provided by NWSC; slum population estimated by authors

In quantitative terms, the performance on pro-poor services provision over the period 2003–2013 is quite impressive, as is the overall performance of NWSC over the same period (see Table 1). Whilst the Kampala population rose by 72%, the number of water connections more than tripled and the number of sewer connections nearly doubled. When it comes to the slum dwellers, their location and numbers are now known to NWSC. The concerned mapping exercise resulted in the demarcation of 25 informal settlements. Over the ten-year period the numbers of PSPs and Kiosks have more than tripled to a present number of 8,717 serving 653,820 people. In addition, 1,613 prepaid

water meters were installed in 16 out of the 25 informal settlements identified; 30,330 tokens were issued of which 97% is actively used. The prepaid meters are estimated to serve an additional 250,000 slum dwellers. All-in-all the pro-poor water technologies serve an estimated 900,000 people or about 84% of the slum dwellers, up from 41% in 2013. Although sewerage and sanitation services have seen improvements, the actual service provision shows that enormous challenges are still ahead. Whilst the doubling of sewer connections and the coming up of community sanitation facilities is in itself impressive, the rate of growth and the overall access are still low and very low compared to drinking water services. Currently, only 8% of Kampala's population is served by the sewerage network system with majority relying on on-site sanitation. Likewise, only about 10% of the slum population is served by the community sanitation facilities.

5 Conclusions

From the study findings, it is seen that service provision to the urban poor has been approached through a host of context specific and mutually reinforced interventions as AWSB and NCWSC (2009) emphasises.

The case of Kampala demonstrates an integrated approach that includes many of the elements that constitute the framework for enabling successful pro-poor services provision outlined by Blokland (2011). This study shows not only that the entire range of 'tools' has been operationalised by NWSC, but also demonstrates – be it in passing – that the pro-poor services initiatives rest on the other pillars, that is; on 'policies, arrangements and capacities', 'collaboration' and 'sustainability'. Although not studied exhaustively, some if not all elements have been given attention, for example political support has been secured, capacity issues have been addressed, collaboration has been established, and technical and commercial innovation has taken place. The study also demonstrates challenges with the mainstreaming of pro-poor services that can be traced to particular elements of the framework such as difficulties with the sourcing of infrastructure investment funds, dealing with some of the vested interests, shortcomings in the incentive systems and some technological issues.

The initiatives and activities undertaken by NWSC underlie the pro-poor corporate social responsibility agenda, which includes a not-for-profit approach. This approach has enabled the development of pro-poor service delivery mechanisms. However, despite the efforts embarked on by NWSC especially in extending improved water supply services to the urban poor, there still stands the need to ensure sustainability of the established systems and the challenge to upscale the present efforts in Kampala and to apply these, either as is or modified to the other towns under the jurisdiction of NWSC.

In consideration of the findings one of the major challenges faced is that the pre-paid meter system technology is insufficiently robust. This has affected the sustainability of service provision and in turn the credibility of the system among the poorer customers. As the Department of Water Affairs and Forestry (2002) puts it, access to a water point is of no use if the water stops flowing. It is therefore important to give more attention to operation and maintenance of the established infrastructure.

Looking at the water and sanitation situation in the observed urban areas, it is obvious that the provision of improved sanitation still lags behind. There may be many reasons for such but the institutional arrangements are certainly part of that. Considering the national institutional setup it is observed that water supply arrangements are rather simple

and that by comparison sanitation arrangements are complex and fragmented. Where water services fall under one ministry (Ministry of Water and Environment) and NWSC is authorised to provide water to specific urban areas, sanitation is spread across three ministries. That is Ministry of Water and Environment, Ministry of Health and Ministry of Education and Sports. This spread has resulted in limited or lack of collaborative practices that has negatively affected the provision of improved sanitation. The example of a coherent system of institutional, organisational, technical and financial tools for providing pro-poor water services should be mimicked in the approaches to solve the sanitation challenge in informal settlements. Apart from the institutional framework, it is also evident that where most of the available mechanisms for delivering water services to the poor are in place and ready for wider application, such mechanisms are still greatly needed when it comes to sanitation.

Overall, NWSC is to be commended on developing and implementing an integrated approach to its initiatives for serving the poor. Some challenges that now stand in the way of mainstreaming, upscaling and sustaining pro-poor services provision will need to be addressed. These include the cost and robustness of the technology, the vested interests, the cross subsidy concept and the incentive systems.

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