RURAL WATER TARIFFS FOR SUSTAINABILITY: CASE OF KAMWENGE DISTRICT

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Summary

In Uganda, rural water supply coverage has stagnated between 63 and 64 % for six years despite the installation of new water supply systems every year. This indicates that it is no longer only about increasing coverage in rural areas but ensuring that the systems in place are maintained in order to keep the water systems operating sustainably. Most tariffs set for water supply in rural areas are high and not within the ability and affordability levels of community members to pay. This deprives and denies people the opportunity to access safe water despite it being in their vicinity. Water For People installed solar at piped water supply and sanitation systems that were previously running solely on generator power in a bid to down the fuel costs which form at least 45% of the operation and maintenance cost.

Introduction

The 17 Sustainable Development Goals (SDGs) cover an extensive variety of drivers across the pillars of sustainable development and comprise a devoted goal on water and sanitation (SDG 6) that sets out to “ensure availability and sustainable management of water and sanitation for all” by 2030.

A tariff is a fee charged for the delivery of a service. In water supply, this fee is levied in most cases by water utility companies and in some cases by water source committees. Several different types of water tariffs are used in the domestic, industrial and agricultural sectors in various parts of the world. The structure of the tariff is typically influenced by the availability of water, consumer income, purpose and usage, and certain socio-economic factors. These include flat or uniform rates, block rates, seasonal rates, peak rates, conservation rates, and capacity rates. The choice and formulation of an effective tariffing system should be based on the factors which influence the price. The charged tariff ought to reflect the quality, timing, convenience and reliability of water supply while accounting for social and political considerations. These are linked to the amount of revenue required to meet the costs associated with maintenance of water supply services.

In Uganda, the rural water supply coverage has stagnated between 63 and 64 % for six years despite the installation of new water supply systems every year. On the other hand, coverage in urban water areas dominated by piped supply systems has steadily increased from 61% in 2007/2008 to 69% in 2012/2013. The urban sector has a tariff policy that guides the setting of realistic tariffs that can sustainably manage the operations of the water supply systems. This policy is not applicable to rural areas where the Water User Committees set a tariff that has minimal consideration of the actual cost of service provision and sustainability. This has created a situation where the Central Government is required to intervene financially to redeem system operations (MWE, 2009, p.5). The stagnation of the coverage in rural Uganda despite new installations indicates that it is no longer only about increasing coverage in rural areas but ensuring that the systems in place are maintained in order to keep the water systems operating sustainably.

Background and Problem

In the past three years, Water For People has supported the construction of six piped water supply and sanitation systems (WSSS) in Biguli Sub County, Kamwenge District in Mid-Western Uganda. The systems are under the management of a private operator who charges a volumetric tariff either per 20-liter container from a public tap or per cubic meter from a domestic, commercial or

institutional consumer. The WSSS are run on diesel generators which accounts for about 45% of the operation and maintenance (O&M) costs and has inadvertently resulted into tariffs that are not affordable to the rural populations who the systems were intended to serve. Thus, most of the community members are still using surface water for their domestic needs which is not safe.

Objectives of rural water tariffs

The major objective of levying a tariff is to enable sufficient collection of fees for water system O&M. Specifically in Biguli, the tariff levied is to meet the following objectives:

1. Promote the use of water by the poor by implementing social tariffs and taking into consideration ability to pay
2. Raise enough revenue to cover specific costs associated with system sustainability
3. Regulate demand and as such discourage wasting water by sending appropriate price signals about the relationship between the use of water and its availability.

Methodology used to set the tariffs

Tariffs are set in close consultation with the local authorities through a participatory process with the beneficiary communities. The following steps are taken:

Step 1: Meeting with the Local Authorities

The local authorities are sensitized and educated by Water For People about the various components of the water supply systems and their associated costs.

Box 1: Lifecycle Costs of a Water Supply System

The aggregate costs required to ensure delivery of adequate, equitable and sustainable water services to an area are the life cycle costs of the system. These include capital expenditure – hardware and software (CapEx), capital maintenance expenditure (CapManEx), cost of capital (CoC), operating and minor maintenance expenditure (OpEx), expenditure on direct support (ExpDS) and expenditure on indirect support (ExpIDS)' (Fonseca, et al, 2010). These costs need to be properly understood to allow for proper planning and monitoring which is essential for development and sustainability of systems.

i. Capital expenditure (CapEx): This is the cost of construction of the system. It is a one-time cost such ase hardware and is used to initially sensitize the stakeholders during the setting up of the system.
ii. Operational costs (OpEx): These are costs that are needed recurrently to keep the systems functioning such as pumping costs, treatment costs, staffing costs and chemicals.
iii. Capital maintenance costs (CapManEx): These are the costs required to replace, rehabilitate or renew assets that are in the water supply system.
iv. Expenditure on direct support (ExpDS): These are used to support activities that take place before or after the construction such as costs that guarantee that local governments have the capacities and resources to plan and implement system breakdowns and monitor service provider's performance.
v. Expenditure indirect support (ExpIDS): These are used for capacity building and maintenance of the supporting institutions and within the local government budgets such as policy, planning and monitoring that contribute to sector working capacity and regulation.

Sources of funding for meeting all the types of costs are then deliberated on using the AtWhatcost Model, a financial planning tool developed by Water for People. During the discussions, it is clearly indicated that these costs are shared between different parties and are not all to be recouped from tariffs. Usually, it is unanimously agreed that 100% of the OpEx should be met by the tariff and a bargain is on the CapManEx which is always taken as 70% or less. The costs to be recouped from the tariffs (100% OpEx and 70% CapManEx) and then divided by the demand to obtain a tariff either per 1000 litres (for tap owners) or per 20-25 litre jerrycan (for public points).

$$Tariff = \frac{\text{costs to be recouped from the tariffs}}{\text{demand}}$$

A strategy is then drawn for taking this message to the community members, which is spearheaded by the local authorities that the community members are accustomed too. Table 2 provides an example of how the tariff is calculated with the community. The calculation clearly differentiates between the CapEx, OpEx and CapManEx and the party responsible for meeting all these costs to enable the community members to appreciate everyone's input in the process.

Table 2: Calculation of tariff with a community / Local Government for rehabilitation of a deep borehole

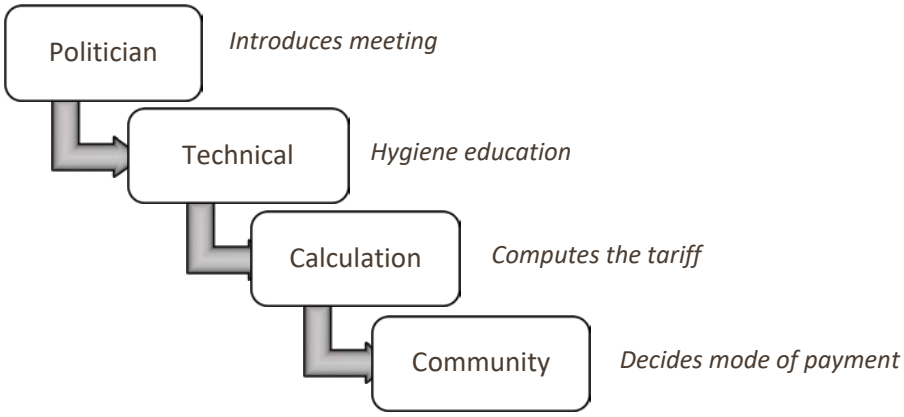
Type of Cost	What is included	Amount (UGX)	Source of Funds
CapEx	Rehabilitation costs	**4,500,000**	District Local Government – 40%, Private Operator – 20%, Water For People – 40%
OpEx (monthly) 54%	Caretaker Fees	**150,000** per month	User Fees
	Spare parts	350,000/12 = **29,200**	
	Hand Pump Mechanic	(30,000*3 + 100,000) = 190,000/12 = **16,000**	
CapManEx (monthly) 46%	Major repairs	4,500,000/(12*3)= **125,000** per month	User Fees
TOTAL	(OpEx+ CapManEx) per month	320,200	
Demand	50 households @3 jerrycans per day	320,200/(50)= 6400 320,200/(50*3*30) = 71	Tariff taken **100UGX** per jerrycan, **29%** PO margin

Step 2: Meeting with the Communities

The meeting with the community is handled by a team of people that was trained in step 1. By the time they move to the field, they all know what the tariff computation will result into and have also discussed possible questions and answers. The steps are indicated in graphic 1.

- The meeting is kick started by the Local Council III chairman who introduces the team and gives a brief about why it is important to pay for water. This is intended to show the community that their political leaders know what is happening and are in full support.
- The Chairman then invites the District Water Officer or any other technical representative to educate the community about the danger associated with inadequate water supply and how these can be avoided.
- The calculation is then done by a technical person with knowledge about the engineering of the system. This in the beginning was done by Water For People, but a lot of capacity has been built in the areas where the approach has been introduced and a lot of ambassadors exist. The calculation gives two modes of payment – a flat tariff per household per month despite the size of the household and a tariff per jerrycan.
- Lastly, the community is given the chance to ask questions and decide on the mode of payment they prefer. This is intended to create community ownership of the payment system. Experience has shown that community members usually opt for the tariff per jerrycan citing differences in the sizes of their households and non-payment or responsiveness by some households. This calls for find a way to ensure volumetric measurements at the water points.

Graphic 1: How to conduct a community tariff meeting



What the reality is

Whereas we initially assumed that each household would collect 3 jerrycans of water per day, this has not been realized. Most households are still resorting to cheaper or free sources of water which are not safe. Table 3 illustrates what was initially envisaged as the calculation and what has actually been realized in the implementation of the model. This indicates that almost 50% of the community members are not using the water point or if they are, they are not collecting as much water per household per day. Feedback from community members is always towards the high cost of the water. We are now exploring strategies to reduce O&M costs so that the tariff can be reduced to be within the range that can be afforded by most the community.

Table 3: Implementation of Model in the Community

	Ideal Situation	Actual Situation
Revenue expected	=50*3*30*100= 450,000	**211,600 (47% of expected)**
CapManEx	= 20%	SC Escrow Account **42,300**
OpEx	= 80%	**169,300**

The tariff obtained for the systems in Biguli subcounty in Kamwenge District ranges between 100-200UGX per jerrycan and 4800-6000UGX per cubic meter. Affordability for water in these communities as informed by the baseline socio-economic surveys conducted at the start of the project ranges between 2500-4000UGX per cubic meter which is out of the range that is being charged currently.

Upgrading to Solar as a Strategy to reduce O&M Costs

Solar pumping is the trendiest technology in rural water supply today. Policy-makers and practitioners are eager to better understand its benefits and limitations, and the private sector is responding with a variety of product offerings. Much of this interest is motivated by the Sustainable Development Goal to increase water service levels in the most remote areas. After years of research and technological advances, it has proven to be operationally, financially, and environmentally sustainable. In recent years, the cost of solar technology has dropped tremendously. Prices for the solar panels used in these systems have dropped up to 80%. In addition, these panels last around 25 years, requiring little maintenance throughout this time.

In March 2018, we upgraded two sites that were being powered by diesel generators in Biguli Sub County to also run on solar energy. This upgrade is expected to reduce the pumping costs by 100% during the dry months (months that usually have low rainfall in Uganda, thus having more sunshine hours for solar power) and by 20% during the wet months (months that usually have high rainfall in Uganda, thus having expected lower sunshine hours for solar power). Wet months include March, April, May, October and November. Fuel accounts for over 50% of the expenses on the Biguli systems so this installation is expected to halve the expenses incurred by these schemes and thus reduce the tariff to at most 4800UGX per cubic meter.

Next steps

1. Explore how solar reduces the O&M costs and the impact this will have on the tariff
2. Better understand the lifecycle costs of solar powered water supply systems