Making Water Infrastructure Last Longer at a Lower Cost in the Arid Lands of Kenya

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Introduction

The lack of an effective approach for Operation & Maintenance (O&M) of peri-urban and rural water systems results in most water-related infrastructure going to waste: 2/3 of rural water systems in Kenya's arid and semi-arid lands (ASALs) are severely dysfunctional within 3-5 years of construction, and about 1/3 are non-functional at any point in time (World Bank, 2015).

Several models have been proposed for O&M services in rural, underserved areas of the arid lands in Kenya – though few have been tested for financial viability.

To understand the feasibility of an at-scale business model in which O&M services for water systems are provided via 3rd-party private sector actors, Oxfam & Le Fil Consulting have partnered in order to:

1. Perform a financial analysis of professionalized, bundled O&M service models for small water service providers in peri-urban & rural areas of Turkana & Wajir counties.
2. Identify the most impactful potential 'levers' to increased sustainability of O&M services and their impact on net profitability (i.e Revenues/ Inputs to the scheme, Savings/ Cost avoidance by the scheme, expenditures).

Materials and methods

- Data collection done as a combination of desk & field work
- Covered 17 water points in Turkana & Wajir Counties, Kenya.
- Data collected from Oxfam programmes, private sector actors, and county water service providers
- To quantify savings generated by investing in O&M to increase infrastructure's lifespan, we analyzed capex expenses needed today to replace early-failing infrastructure, and compared to O&M expenses necessary to maintain the infrastructure for full 12-year lifespan.

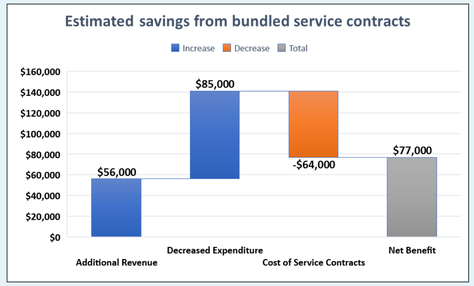
Findings – the 3 most impactful sustainability 'levers'

Private sector engagement – coupled with three main changes to County-level regulatory frameworks – can introduce a private-sector led model for O&M which can generate cost savings & additional net revenue. This is driven by 3 sustainability 'levers'.

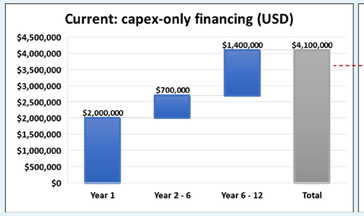
We estimate that a pilot with 100-120 schemes would generate over 15M Ksh ($144,626) in savings and 13M Ksh ($125,343) in additional net revenue, thereby freeing resources for over 28M Ksh ($270,000), which could finance further infrastructure development.

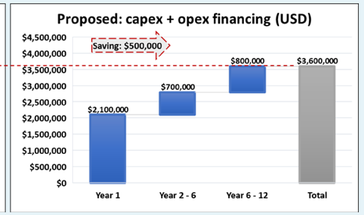
Sustainability Lever #1: Bundled service contracts

-Reduce downtime, decrease scheme-level opex
-increase investment in opex
-systematically embed preventative maintenance
-ensure market demand at scale while guaranteeing payment
-for a pilot of 114 boreholes, we estimate a net benefit of 77K USD/year



For a 'cohort' of 60 newly-built boreholes (total capex 2m USD),one needs to invest another 2.1m USD in reconstruction over the course of the following 12 years, to keep up with the boreholes that break down prematurely (left-side chart). Under the new model, capital expenditures are replaced by O&M expenses (calculated at 7% of initial capex per year), stretching the infrastructure's lifespan to its full potential. Over the 12 years, these O&M expenses would add up to less than 1.7m USD, leading to net savings of about 0.5m USD over the 12-year lifecycle (right-side chart).





Sustainability Lever #2: Avoid tariff leakage

-automated tariff collection (increase collection rates & convenience
-cashless payment system – addresses issue of tariffs that are collected but misappropriated

Sustainability Lever #3: Ensure availability of O&M funds

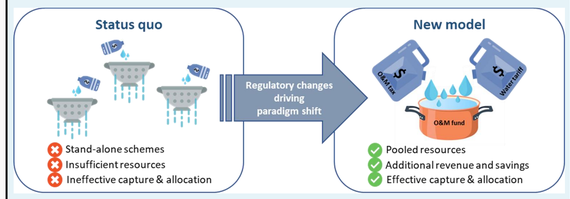
-O&M tax: any installer of a water system pay a tax equal to 7% of capex
-Pooled & ringfenced O&M fund – dedicated fund to pool O&M tax + tariffs
- Fund managed by external trustee to limit misappropriation, with rules to (1) spread risks & allow for cross-subsidy, & (2) avoid penalizing better-performing providers

Conclusions

Our estimates demonstrate that a minimum of 30- 57 water systems (given geography with an estimated round trip of 100km) must be bundled together to make service contracts financially viable.

Shifting a relatively small percentage of capex subsidies to opex subsidies can significantly increase the sustainability of rural water service providers.

All of this must be driven by County government buy-in and regulation. Regulatory change can be the critical driver for increased investment and competitiveness in O&M services. In particular, policy changes around how funds are pooled and ringfenced are critical to attract private service providers.



Where are we now, and what next?

•Oxfam appointed by Water Service Regulatory Board (WASREB) to special committee working on sustainability of water management models.

•developing WASREB to pilot and refine O&M fund in 3 counties

•finalizing arrangements with 3 counties to pilot this approach with support of Oxfam and Le Fil Consulting

•Developing work plan for pilot with county governments:

-road map for regulatory changes;

- baseline assessments (performance of infrastructure & cost of O&M);

- service contracts with private sector.

-design, structure and set up the fund (O&M fund governance, bundled contract design, scheme selection, mechanisms to channel funds, etc.)

-raise funding to "prime the pump" for the O&M Fund.

Further information

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