SSAWA
Market Brief

ISSUE no3 (Jan 2013)

The Decentralized Water Market

Assessing and Overcoming the Hurdles to Scale in Kenya

safe water network

IFC International Finance Corporation
World Bank Group

ACKNOWLEDGEMENTS

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Safe Water Network is a non-profit organization with a mission to be an active catalyst and sector leader in the development of sustainable, scalable market-based solutions that deliver safe, affordable drinking water to underserved populations. Safe Water Network is mobilizing partnerships, resources and funding necessary to develop and demonstrate new and improved solutions – technologies, systems and operating and funding models – to improve the health and livelihoods of impacted populations.

This market brief is published jointly by IFC and Safe Water Network. The brief draws insights from a wide range of different market-based approaches developed in the Kenya water sector, as well as international experiences reviewed in Ghana and India. These experiences are intended to provide the private sector, and other sector stakeholders, with a deeper insight into this challenging and high-impact sector.

This market brief provides a summary of the full assessment, which is available for download at www.safewaternetwork.org and www.ifc.org/ssawa.

For Safe Water Network, the principal author of this study is Hew Crooks. Amanda Gimble, Bob Stea, Ryan Hebert and Frances Kimani offered analysis that was incorporated widely. The author wishes to acknowledge Robert Gakubia and the other professionals at WASREB, Elly Aguko of K-Rep Bank, Rajesh Advani of the Water and Sanitation Program (WSP), Kariuki Mugo of Water and Sanitation for the Urban Poor, George Masaba of Grundfos LIFELINK, and Onesmus Muthoka of Onesmerc International Trading Company, for sharing their experiences and lessons learned from the various case studies described herein.

For IFC, this study was conceived under the Sanitation and Safe Water for All (SSAWA) program. SSAWA is an advisory services program designed to support market-based approaches with the potential to expand access to safe water and sanitation for underserved consumers. Input and guidance throughout the study has been provided by Will Davies, the manager of the SSAWA program.

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1. INTRODUCTION

Traditionally, commercial investors in the water sector have focused on large municipal infrastructure projects, where individual transactions are of sufficient scale to attract commercial project finance. Such projects, involving capital-intensive network infrastructure, focus on formal urban centers, often neglecting poorer consumers living outside of these areas. "Base of the pyramid" populations that those large utility systems fail to reach – rural communities, and poorer urban customers living within informal settlements and rapidly growing peri-urban areas – have been left to receive water from a patchwork of donor and development agencies, small-scale vendors and re-sellers.

Water provision for the poor has long been considered a concern of the public sector, to be dealt with by governments and subsidized by donor and nongovernmental organization programs. However, despite huge investment and effort – registered aid to Sub-Saharan Africa alone for water and sanitation is close to $3 billion per year – sustaining increased access to clean water remains a challenge. Even where public investments have succeeded in putting in place the necessary infrastructure, the technical capacity and cost-recovery mechanisms required for long-term sustainability of operations are often lacking.

In response to these challenges, new business models have begun to emerge, harnessing the innovation, technical skills, and financing of the private sector to provide affordable and sustainable water supply services. One area of innovation is in the field of off-grid, distributed services, an approach to delivery of basic services, such as power and water, to rural communities across the developing world through small-scale, decentralized facilities. The economic driver behind this approach is the reduction of capital costs as a result of reduced grid-connection infrastructure (pipes and transmission cables), which increases the potential for financial sustainability, even for utilities serving small populations.

Recognizing this trend, IFC, a member of the World Bank Group, and Safe Water Network, a not-for-profit organization focused on market-based solutions, have undertaken an assessment of the market for decentralized water supply in Kenya. The assessment draws insights from a wide range of different market-based approaches developed in the Kenya water sector, as well as international experiences reviewed in Ghana and India. These experiences are intended to provide the private sector, and other sector stakeholders, with a deeper insight into this challenging and high impact sector.

This report assesses experiences with decentralized market-based approaches in the Kenya water sector, with a view to identifying options for attracting greater commercial investment in the sector, both in Kenya and elsewhere. The report examines the existing policy environment for commercial provision of water, as well as the willingness and ability of the population to pay for water at prices necessary to fund private investment. It reviews existing models to determine whether they could be replicated at scale. Finally, the study compares the Kenya experience with that of other countries, in order to identify the changes needed for scalable models to take hold locally.

Kenya is a water-challenged country, with a variety of hydrological, geographic and demographic conditions faced in the commercial provision of water. Diverse water challenges require a range of technical solutions, generating very different capital and operating cost structures. Projects that tie into existing networks with inexpensive bulk supply serving high-density urban populations may be feasible selling water at KES 2 (US$0.02) per 20 liter jerry can, while a rural system needing borehole extraction, piping and fluoride removal might only be commercially feasible at pricing of KES 12 ($0.13) per 20 liters.

Meanwhile, consumers are generally unaware of the cost implications of different technical parameters. The existence of a formal KES 2 per 20 liter price cap enforced for kiosks that are part of larger regulated networks contributes to the sense that this is a "fair" price for water, regardless of the underlying cost. This presents a challenging environment for private operators in most cases.

Despite these challenges, some innovative initiatives have been established which are achieving success in providing access to water through market-based mechanisms.

In general, such approaches will take advantage of available concessionary funding to either partially or fully buy down upfront capital costs. The benefits of "market discipline" should then come into play at an operational level to ensure financial sustainability of the water services over time.

Sector Overview and Environment

Kenya has made tremendous strides towards sustainable water provision since 2002, when the sector was restructured under a new Water Act. Established in early 2003, the Water Services Regulatory Board (WASREB) has tackled the difficult task of transforming a dysfunctional and uneconomically structured water sector, while continuing to recognize the social aspect of water provision and the need to improve water access among the poor. Though the sector structure is likely to change slightly as a result of the new Constitution enacted in 2011, the record of accomplishment is expected to continue, along with the key underlying trends:

- Improved Sector Transparency and Accountability: highlighted by the annual "IMPACT Report" that rates the performance of all Water Service Providers (WSPs) and Water Service Boards (WSBs);
- Tariffs Based on Cost Recovery Principles: achieved through a transparent adjustment process;
- Focus on Sustainable Operating Performance: tariff increases to cover operational expenditures, debt pay down and investment are granted only where operators show progress to meeting standards of operating efficiency; and
- Expansion of Service: including tariff credit to WSPs that expand coverage to poor and underserved populations.

Priorities for the next several years include a continued focus on sustainable expansion, pursuing the dual mandate of economic viability and expanded service to poor, as well as a plan to diversify sector funding beyond traditional budget and funding partner sources, to close the water provision gap in the face of continued population growth.

Gaps and Opportunity

The approach of the Kenya government and regulators, with a primary focus on strengthening of water provision through formal Water Service Providers (WSPs), is driving the sector in the right direction; however, significant gaps remain. Regulated WSPs currently serve only 25% of Kenya's population, including less than 5% of the rural population, indicating the need for complementary approaches. The capacity of WSPs to finance expansion is also mixed, as demonstrated by the results of the 2011 WASREB Water Utilities Shadow Credit Rating Assessment.

This gap in service provision could be filled in part by independent "off-grid" operators. Individual efforts are not well coordinated, however, and any private operator faces multiple hurdles that are difficult to overcome without substantial changes to the enabling environment and the development of supportive financing mechanisms.

2. HURDLES FACED BY THE COMMERCIAL PROVIDER

The limited private commercial involvement in the water sector in Kenya, as in most developing countries, is the result of a range of technical, economic, demographic and social hurdles.

Ability and Willingness to Pay

Consumers in the Kenyan market appear to focus mainly on access to water, with the safety of that water a secondary concern. In many poorer communities, users opt for cheap or free untreated alternatives rather than paying for safe, treated water. This results in paid per capita consumption that is typically much lower than levels needed for a commercially based, decentralized system to survive.

Development organizations and governments often cite daily water consumption in the 20L per capita range as a "minimum" acceptable level, with about 7.5L of this for "safe water" uses, primarily drinking and cooking.[1] Governments then dictate that systems and projects be sized to this level. Field research, however, indicates that paid consumption for kiosk-based systems in Kenya is generally much lower, typically only 2L to 3L per capita.

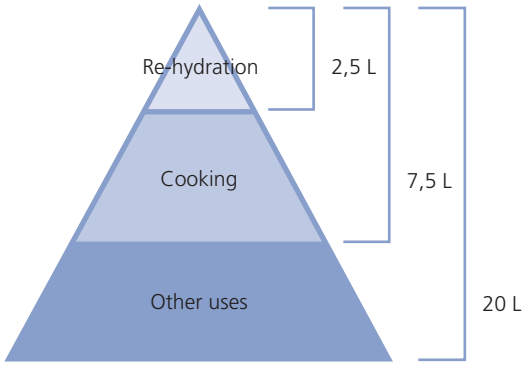

Figure 1: Daily minimum per capita water needs[1]

In fact, none of the decentralized water business cases reviewed for the report met these volume targets (it should be noted that this refers to findings for "kiosk" models where consumers must walk to fetch water, usually in 20L jerry cans, and that piped systems with household connections generate significantly higher consumption levels).

This means that systems designed for commercial sustainability often fall short versus projected cash flow. It also indicates a potential misallocation of scarce investment resources, as projects are over-sized to meet unrealistic demand levels.

Moreover, the unwillingness to pay was seen even at very low prices. Our review of the Karagita project initiated by Water and Sanitation for the Urban Poor (WSUP), described in box 1 on the next page, illustrates this point. To mitigate the high cost of fluoride removal, the project treated only a portion of the water supply, making two water "streams" available at its conveniently located kiosks. The premise was that residents would pay a higher price for treated water to use for drinking and cooking, and would buy the cheaper, untreated water for other general uses. Of note, pricing for both water types was lower than the price residents had previously paid for untreated water. The expectation was that 20% of the water (about 3L per capita) would be treated and 80% (12L per capita) untreated.

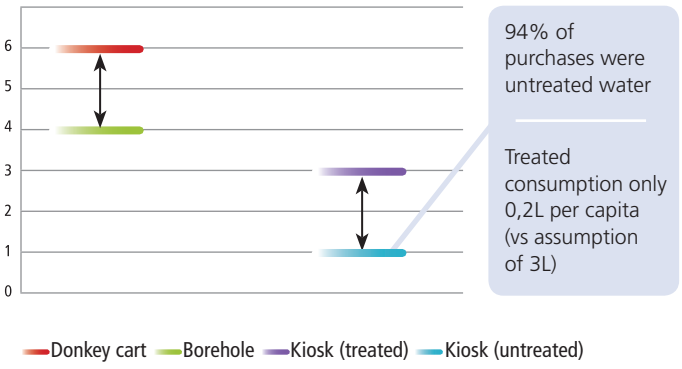

Figure 2: Pricing and Consumption, WSUP project in Karagita

Instead, 94% of the water sold was untreated, with average consumption of treated water less than 0.2L per capita, suggesting that residents were drinking untreated water to save KES 1 per 20L. This occurred even though the project enjoyed broad community acceptance and was generally viewed as a success.

1. Source: "*Domestic Water Quantity, Service Level and Health*", World Health Organization 2003.

Box 1

Case Summary – WSUP Karagita (Naivasha)

The project represents a new legal and business model for Kenya, bringing regulated service to low-income areas through fully integrated, decentralized private operators under formal contracts with WSPs and WSBs.

Located in Karagita, a medium-density settlement of 24,000 people outside Naivasha, the project consists of a stand alone network including borehole raw water supply, storage and selling through 14 manned kiosks. It sells two separate water types: one that has been treated using a bone char process to reduce high fluoride levels, as well as cheaper, untreated water intended for washing and other non-consumptive uses. Both water types are priced lower than previously existing donkey cart supply.

The project has gained wide acceptance in the community, though overall volumes have been lower than initially projected. Residents have overwhelmingly purchased the lower cost untreated water, indicating that it is being consumed despite the health risk of excessive fluoride levels. The sponsors are working to improve education around this issue, though it is expected to require a long-term approach to change consumer behavior.

The designated private operator has struggled to maintain economic viability in the initial years of the project, due to the lower than expected sales, combined with the cost of borehole pumping and treatment. An early 2012 tariff increase (50% on treated and 100% on untreated water) should allow the system to generate a consistent operating surplus. At KES 2 (untreated) and KES 3 (treated), prices remain much lower than alternative sources.

The project was structured to maintain commercial operations, though not to repay the capital investment, which exceeded $350,000 for all phases. Analysis shows that a fully commercial solution without concessionary capital would require tariffs of KES 5 to KES 6 per 20L for untreated water (compared to the current level of KES 2.) Considering the pioneering nature of the project, which included protracted development and negotiation, capital costs could be reduced for future comparable projects.

Overhead storage tanks at Karagita project in Naivasha.

Highly Seasonal Demand

The problem of low paid per capita consumption is compounded by severe seasonality of demand. During times where rainwater and other "free" surface water is available, sales from commercial providers drop precipitously. The Onesmerc system in Mbooni West (Machakos), described in box 2 on page 5, shows a high inverse correlation to recorded rainfall as shown in Figure 3, illustrated by a dramatic 91% decline in monthly sales volume corresponding with the onset of the rainy season. During the dry season, the system cannot supply enough water to meet demand; meanwhile, during the rainy season, sales do not cover direct costs. Similar results were observed at many other rural systems in Kenya, regardless of water price.

Seasonality of demand has implications for capital investment efficiency also. Considering the social dimension of water as a basic human right, systems should be sized to meet peak demand, which by definition occurs at times of maximum scarcity and need. Meanwhile, economic feasibility would call for lower design capacity.

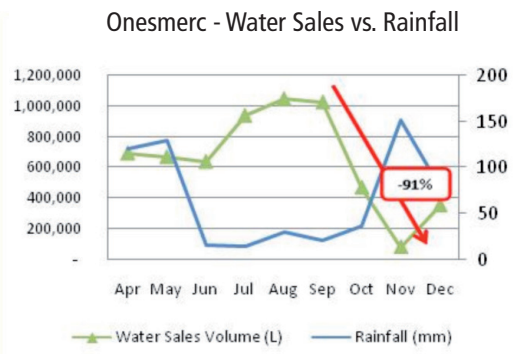

Figure 3: Impact of rainfall on water sales, Onesmerc project in Mbooni West, Machakos

Low Water Pricing

Expectations surrounding pricing may be the most significant obstacle to overcome if decentralized water provision is to grow in the Kenyan market. Larger WSPs are encouraged to expand coverage to poorer and underserved areas at subsidized pricing, which is recovered through household tariffs. This serves to establish a price expectation of about KES 2 per 20L jerry can for safe water. The presence of NGOs and the rural projects of the Water Services Trust Fund reinforce that kiosk pricing should be at this level or less. Meanwhile, off-grid commercial providers do not have the same ability as the larger WSPs to cross-subsidize lower kiosk pricing with revenue from household connections.

Analysis of systems both within Kenya and elsewhere shows that this price is only sustainable in a Delegated Management Model (DMM), where the commercial operator is supplied with inexpensive bulk water from a utility provider, and in areas of high population density. In cases where the commercial operator must provide a full solution including abstraction, conveyance, treatment and distribution of water, pricing needs to be between KES 5 and KES 12 to be financially sustainable, depending on the particular source water challenge, pumping and treatment requirements.

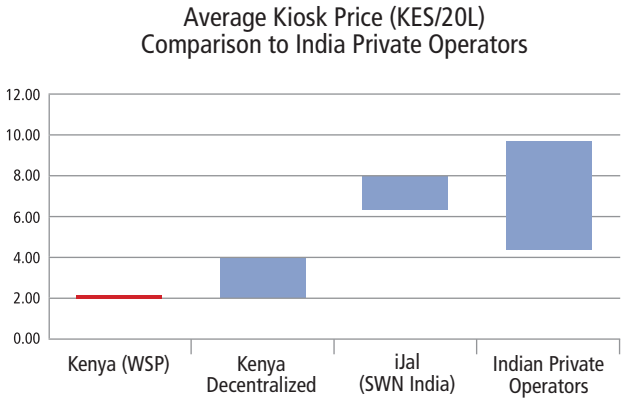

Figure 4: Summary of typical observed pricing in Kenya and India

Figure 4 provides a comparative analysis of Kenya "market" prices versus prices charged by decentralized kiosk operators in rural India, which face comparable population density and source water challenges. The graph at right shows a comparison of pricing for leading Indian private kiosk operators, converted to Kenya Shillings at prevailing rates. The Indian private operators surveyed sell treated water, typically with Reverse Osmosis systems. Capital and operating costs for comparable systems would be higher in Kenya, suggesting that pricing levels would need to be higher also.

Box 2

Case Summary – Onesmerc (Mbooni West, Machakos District)

Onesmerc International Trading Company, Ltd. is a privately financed and operated water delivery business that serves communities, households and schools in the Machakos region of south-eastern Kenya, a water-scarce area that has been experiencing acute seasonal drought conditions since 2008.

The entrepreneur, Mr. Onesmus Muthoka, was motivated to seek a secure water supply after losing livestock from the drought. Beginning in early 2010, his efforts have produced a system that brings spring water via pipeline from a source in the hills 8km from his farm, and distributes chlorine-treated water by truck to a series of eight kiosks in area communities. Onesmerc also supplies water directly to farms and households, and to schools under a government-funded program.

Water at the two main kiosks is priced at KES 5 per 20L, while water delivered to further towns is priced at either KES 10 or KES 15, depending on the distance and cost of truck delivery. The project is financially successful due to a low cost structure, sales that are balanced between kiosks, home delivery and supply to schools, and by charging a price higher than other systems, which is accepted by consumers in this water-scarce region. If prices and volumes remain within current ranges, the total capital investment of about $150,000 will be recovered within seven years, while the system provides a reliable source of safe water to this region of 21,500 people.

Tanker delivers treated spring water to scattered communities

Onesmerc is a rare example of an independent entrepreneur investing to establish a significant water business to serve a broad area, and growing the business without the benefit of government or NGO support or subsidy. Though an encouraging example of commercial success, it enjoys a set of favorable circumstances that may limit its applicability elsewhere in the country.

Erratic Supply of Source Water

The most cost-effective means of extending supply is through network extensions under Delegated Management Models, but many existing WSP networks lack reliable source water supply to support meaningful expansion. The example in Figure 6, taken from the Safe Water Network-supported Shining Hope project in Kenya, illustrates the risk. Although this system had significant storage capacity, system-wide shortages left it without water to sell on half of the days in February 2012.

To attract serious operators willing to invest in system maintenance and expansion, the bulk water supply must be secure. If the private operator must invest capital to provide secure back-up supply, projects will require substantial

subsidies or increased overall pricing, or a "peak" pricing model, which is understandably seen as unacceptable in the water sector.

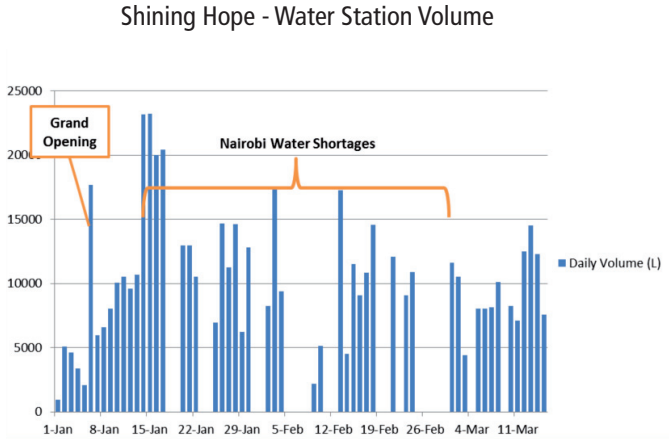

Figure 5: Daily volume at Shining Hope Water Station, Feb. 2012

3. OPPORTUNITIES FOR COMMERCIAL OPERATORS

The report identifies several categories of opportunity for private commercial operators to work in concert with sector reform.

Urban Market: Delegated Management Models

Accelerating development of urban coverage should take advantage of the market's inherent commercial strengths:

- Faster growing, high-density populations to support investment;
- Current habit and experience of paying for water (often from informal vendors at higher prices); and
- Availability of bulk supply and electric connections.

The Delegated Management Model has been pioneered in cities including Kisumu and Mombasa in Kenya. The economic attractiveness of this model lies in the availability of low-priced or subsidized bulk water, which essentially allows the private operator to offer water at a subsidized price. The report estimates that this market opportunity could reach $20 million in the medium term and as much as $50 million over time, though the path to penetrate this fragmented market will be slow.

Each red column on the chart in Figure 6 represents the number of hours an individual WSP provides water to its customers. Each blue point represents the percentage of its designated population each WSP is serving. The best near-term opportunities for network extensions are likely to rest with those WSPs that are providing 24 hour coverage, but only reaching a small percentage of their population. Where WSPs are not providing 24 hour service to their existing customers, it implies that more substantial infrastructure investment is required to increase water supply before networks can be reliably extended.

The Water Services Trust Fund is a state corporation charged with increasing access to water for the poor rural and urban populations in Kenya. In the urban sphere, the WSTF has chosen to fund construction of community kiosks through the larger WSPs. If the WSTF were to provide funding and support to a Delegated Management Model, it could have a transformative impact on the development of this promising model.

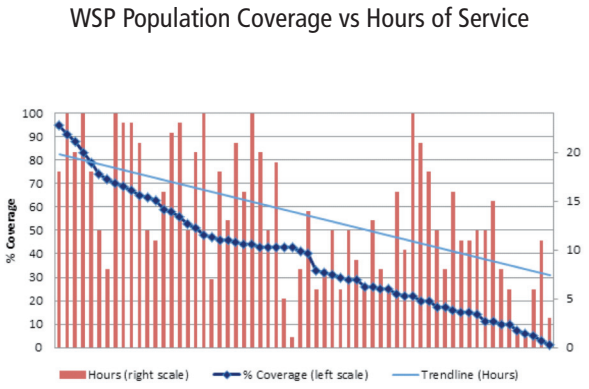

Figure 6: WSP coverage of designated population and daily hours of service

Rural Market: Decentralized "Kiosk" Models

The rural market comprises the largest number of Kenyans without safe water, but poses significant challenges to commercial development. The hurdles include dispersed populations, lower income levels, seasonality of income and demand, lack of payment history and high treatment cost. These are exacerbated by a tradition of donor-financed projects leading to an expectation of free water.

Following a broad desktop and field analysis of existing projects throughout the country, the report identified only one successful example of a purely commercial private investment serving a broad population. This project, the previously described Onesmerc system, enjoyed the benefit of low-cost gravity-fed spring water supply, plus high demand due to regional drought conditions. There was also a substantial bulk delivery business, and water was sold at comparatively high prices versus other projects, though the analysis showed that this pricing was appropriate to repay the private investor capital. These unique advantages limit the applicability of Onesmerc as a model to be widely replicated.

Another pioneering project is Grundfos LIFELINK, described in Box 3 on the next page, which marries the solar-powered Grundfos SqFlex pump with a groundbreaking automated system that allows unmanned operation and mobile phone payment. The system can currently be used only in instances where there is safe source water, as it does not include a purification component, though Grundfos LIFELINK is working to develop this capability. Although one goal of the model is to generate surplus funds for the community, not all systems are achieving the minimum volumes needed to service the monthly maintenance fee (Grundfos is absorbing any shortfalls.) This does not seem to be due to any flaws in the approach, rather it is the result of the typical low per-capita consumption levels and highly seasonal demand patterns. Grundfos LIFELINK continue to work with other sector participants to improve community acceptance and usage. The innovations of the model, including automated payment system and unmanned kiosk model may in fact be more suited to higher-density urban locations than to the rural areas that were initially targeted, and Grundfos LIFELINK is refining the model to test this, as well as to make the payment system available to other project developers.

Water collection by animal cart at a remote LIFELINK station

Box 3

Case Summary – Grundfos LIFELINK

The LIFELINK project is an innovative approach to decentralized water provision initiated in 2009 by the Danish water pump and equipment maker Grundfos. LIFELINK was designed to address some of the challenges of providing a sustainable water solution to low income communities in rural and peri-urban areas in Kenya. These challenges include the lack of power, problems with revenue collection or unaccounted-for water, and technical service and maintenance.

The Grundfos LIFELINK system is a standalone, solar-powered system coupled to an unmanned dispensing and payment unit. The principal innovation is the development of a mobile phone-based closed payment system that avoids the problems associated with cash transactions and revenue collection. Purchases automatically fund a monthly maintenance account, with surplus funds sent to the community. The current system does not provide treatment (though Grundfos is working to introduce treatment options) and is therefore used only where there a safe groundwater supply can be secured.

Local woman uses LIFELINK automated dispenser

The LIFELINK projects have not yet achieved financial sustainability in most cases, as they face the significant challenges identified in this report, particularly volumes that are low and highly seasonal. With experience throughout the country, Grundfos is focusing on addressing the barriers to sustainability, by producing lower-cost systems, and partnering with leading NGOs who can provide the necessary training and education to generate higher demand.

Rural Market: Rehabilitation of Community Systems

This assessment finds that a significant opportunity for near-term impact may rest with the rehabilitation of existing community piped systems and the introduction of private management and investment to these systems through a Build Operate Transfer (BOT) model. Though precise figures are not available, an October 2011 IFC report, The Market for Small-Scale Piped Water Systems in Kenya, estimates a current stock of 2,400 of these small community piped systems exist in Kenya, serving more than 5 million people. Most operate with volunteer management, and 95% are operating without formalized license agreements.

Bringing new funding and professional management to this segment could be a major complementary track to the ongoing reform and consolidation of the larger WSPs. The economics are generally more favorable than stand-alone kiosks, particularly where existing infrastructure can be utilized, and where investment can be focused on higher return opportunities to increase volumes and coverage.

The sheer number of these systems, coupled with the lack of information and the difficulties of approaching each community individually, suggest that reform will not occur naturally via the larger WSPs, nor can it be left to interested private operators and engineering firms. It requires a separate, focused initiative to address current shortcomings of the community systems, as well as the shortage of qualified (and interested) operators. Without external support, involvement of investors will be erratic and insignificant in the scope of sector reform.

A primary challenge surrounds the tariff implications of moving from a subsistence level model to a commercial model. To counteract this problem, the community must be offered a complete solution, rather than just a tariff increase. This should include financing, investment, improved service, simplified billing and better water. It would also be helpful to have a strong training program for operators and technicians, as well as for business management, so that the improved systems could eventually be managed locally.

This subject area is discussed further below under sector financing.

4. SECTOR FINANCING

The major portion of financial capital for investment in water infrastructure comes from the Kenyan government and its Development Partners, channeled via the Ministry of Water and Irrigation to the Water Service Boards or the National Water Conservation and Pipeline Corporation (NWCPC). Of the total budget of approximately KES 32 billion in 2010 (about $355 million), KES 12 billion (37.5%) came from the general budget, with KES 20 billion (62.5%) from outside donors and multilateral agencies, primarily in the form of grants and loans to the government. Since concessional funding is unlikely to rise significantly for the foreseeable future, bringing additional sources of funding is crucial to expand the pace of service delivery in the Kenya water sector.

Commercial Finance

Kenya has very well developed local financial markets; commercial investment in other infrastructure sectors, such as telecoms and energy, is now mainstream. The water sector is currently lagging, and while local banks indicate willingness to support water projects in theory, they highlight a lack of credit worthy projects as well as limitations with their own funding lines to support the longer tenor projects common to the sector. Another factor of great concern to banks is the "reputational risk" of being forced to take action against a failing community water project.

> *"Partnership with the private sector (is) critical in plugging the finance gap for infrastructure development."*
>
> WASREB,
> "Financing Urban Water Services in Kenya:
> Utility Shadow Credit Ratings 2011"

The logical starting point for commercial lending is with the WSPs, since they earn the bulk of the revenue in the sector and are structured in corporate form. In such cases, commercial finance could be directed at higher return investments (network densification, expansion, metering and other improvements to reduce non-revenue water), while Water Service Boards would continue to be responsible for major infrastructure investment.

In order to demonstrate the viability of lending to urban WSPs, IFC and the World Bank Water and Sanitation Program (WB - WSP) are currently appraising potential investments in financially viable expansion projects for the more creditworthy Kenyan WSPs. Should these transactions be successful, it is hoped this could provide the impetus needed for local banks to invest in the sector.

A significant milestone in this effort occurred in late 2011 with the publication of "shadow" credit ratings for the 43 Urban Water Service Providers in a joint undertaking between WASREB and WB-WSP. These ratings, which involved a thorough credit review and analysis process, provided for the first time a clear financial profile of the WSPs, complementing the operating profile provided in the annual "Impact" reports. The report showed that 13 out of 43 WSPs were potentially creditworthy, though total borrowing capacity would be modest initially. (The report estimates total loan capacity of about $24 million in the near to medium term.)

A further entry point for the commercial banking sector is for credit lines to support individual household connections, provided in structured programs arranged through well-managed community water systems and WSPs. In instances where the water provider has strong billing and revenue collection measures in place, it can act as the repayment conduit and loan aggregator, which streamlines the credit process, allowing better terms for the consumer than those seen with typical microfinance.

The "Maji ni Maisha" financing program

The landmark Maji ni Maisha program led by K-Rep Bank, with the support of WB-WSP and the Global Partnership for Output-Based Aid (GPOBA), stands as a major accomplishment for sector finance in Kenya, although at about $3 million it is still at an early stage in terms of overall sector funding. Designed as a means to use output-based aid to partially subsidize expansion projects for community water systems, it represents an important attempt to bring commercial finance to the sector. The experience has been generally positive, but has also highlighted the significant challenges to working directly with community water systems.

In summary, the terms of the program call for 20% equity funding from the community, 80% debt finance from K-Rep Bank, with half of the loan (40% of total project cost) forgiven through the release of output-based aid when the project achieves agreed metrics for incremental water volume and new connections.

The $1 million, 10 project pilot phase of the Maji ni Maisha program was implemented directly between the bank and communities. Although the loan experience has been successful in terms of repayment, the administrative burden surrounding each project proved very high. As a result, an expanded phase of the program was introduced that provided a wider range of financing options, including the option for community projects to be channeled through (and backed by) existing larger WSPs. In such cases, the project identification still comes from the community, but the preparation and negotiation are undertaken by the WSP. The loan itself is a general obligation of the WSP, with the Output-Based Aid subsidy providing a reduced finance cost and better project economics.

This puts the lender in a more comfortable position, because it can look to the overall financial strength of the WSP, and rely on the fact that the amount of debt (typically $30,000 - $50,000 after the subsidy) is small in relation to the WSP's balance sheet.

A limitation of the program is the requirement for 20% of project funding to come as cash equity from the community, which is not feasible for many. In addition, the primary metrics for determining the release of output-based aid are customer additions and volume increases; additional options focused on improved efficiency, water treatment or reduction of non-revenue water could increase the impact of the program.

To ensure operational sustainability, the first phase of the program encouraged communities to retain a private operator to support system management. This measure met community resistance as it often appeared only to impart extra cost on already tight project economics. A modified program in which approved, better-capitalized operators join as financing partners, bringing a turnkey solution of capital, management and improved performance, could form the basis for a program to transform the sector.

Such a "Build Operate Transfer" (BOT) model could serve not just as an expanded financing solution but as a tool to change the operating paradigm in the rural water sector. This framework would involve a private operator/investor contributing capital as well as management expertise. Depending on the aims of the community, operator and lender, the capital could result in a controlling ownership position, or a subordinated loan.

5. **BOT** MODEL: REQUIREMENTS FOR SUCCESS

In the field of public-private partnerships, it is well documented that the primary advantage of the BOT model over more simple management models is the greater share of risk transfer and financing from the public sector to the private sector. For the private sector, the willingness to accept this risk is premised on the increased profitability of the BOT contract, which is essentially both a construction and management contract rolled into one.

If pursued, a successful BOT program would need strong leadership and support from government, regulators, professional advisors and development funding partners to create an enabling framework for the approach. Most importantly, however, it should not be a top-down approach; rather, it would have to include active participation and input from potential private operators. Otherwise, the risk is high that the process would fail to generate interest from investor-operators. Elements needed to meet the needs of operators in Kenya should include:

Accurate Database of Projects to Streamline Process

Information about existing systems is incomplete, leaving a daunting front-end task for any private party interested in partnering with a community. A "data room" for potential operators to review projects should include a rapid assessment of source water, community demographics, technical issues, local political structures and a snapshot of operating/financial performance.

Clear Toolkits and Selling Sheets for Communities

Any program must be clearly articulated to communities and provide a roadmap for them to professionalize their systems. It should include the alternative to retain management, but also provide clear and straightforward analysis to enable communities to understand the benefit of bringing in a professional operator, including a process for selection. This should also include a standard qualification process for approved operators.

Develop a BOT Framework with Incentives that are Easily Understood

The beauty of the current Maji ni Maisha financing model is that it is simple and straight forward (although this also means it lacks flexibility). With the input of potential investors and communities, a small number of two to three specific models should be chosen and promoted.

Investigate Structural Modifications to Improve Capital Efficiency

If private operators are involved as capital partners, it may be possible to modify the current "delayed subsidy" of the Maji ni Maisha approach in favor of the operator posting a performance guarantee or bond. This could form an additional economic incentive for a community to pass project control to a more creditworthy private operator.

Consider Greater Subsidies for New Systems Versus Expansion Projects

A one-size-fits-all subsidy approach is inconsistent with the vastly different circumstances facing many community systems. It is suggested to wait until the process of building a data room is complete, to allow the assessment of the inventory of projects and prospects. Dividing these projects into different types, with different combinations of smart subsidies and incentives, may make sense if it turns out that only a small proportion are viable in the current approach.

Publicize Success Stories

The primary objective of this effort would be to create a "pull" dynamic, so that communities are disposed to actively seek the participation of professional operators, and where existing managers are pressured by their constituents to improve supply and service.

6. ENABLING ENVIRONMENT TO SUPPORT COMMERCIAL OPERATORS

The small commercial operator faces significant hurdles to create a viable business, with many challenges that lie beyond the scope and capability of an individual investor. Though progress has been made, the environment is not yet supportive of commercial efforts. The following are recommendations to create an improved environment, which could be implemented in support of a specific program:

Extend cross-subsidies beyond existing WSP networks

A central plank in the platform to increase water coverage is the pro-poor kiosk pricing policy of existing WSPs, subsidized by tariffs from the remaining user base of household connections. A decentralized operator who is filling a gap in coverage (such as the WSUP Karagita project) should enjoy the same benefit that accrues to an in-network expansion. This would require a "synthetic" cross-subsidy covering the difference between the higher cost to provide water from a stand-alone source and the comparable bulk water network tariff.

Establish the case for safe water, with improved oversight

Consumers are bombarded with messages from many different sources. Reputable operators can make some headway through transparent communication, including publishing reports of third party testing, but a government validation of what is safe versus unsafe, combined with improved education on the health and economic benefits of safe water, would be a significant boost. Until consumers value safe water, commercial providers will struggle to operate sustainably.

Continue to Formalize Sector with Better Incentives; Streamline Permitting Process

Provide clear incentives, first for systems to register and begin to report, and eventually to upgrade management and embrace commercial operating models. The current requirement for registration does not provide sufficient incentive to take this step.

The process for obtaining extraction permits and other licenses is difficult for small entrepreneurs and communities. A simplified process (perhaps including an economic incentive) would be helpful to bring operators into compliance, a necessary step toward obtaining finance.

7. NEXT STEPS

Our review of the market and the possibilities for off-grid commercial provision of water indicate that the greatest impact could be achieved by focusing in the following areas:

Urban Water:

- Complete a more detailed review of high-density urban areas to identify promising opportunities for network extensions and delegated management models;
- Prioritize opportunities where current or expected source water supply is sufficient to support network expansion under Delegated Management Models (DMM);
- Engage Water Services Trust Fund to include a DMM approach in its Urban Projects Concept; and
- Investigate possible mechanisms to provide cross-subsidies to developers that must invest in source water supply to extend a network.

Rural Water:

- Bring key participants together (including potential operators) to develop a structured approach to securing private investment in the community water sector under BOT/delegated management models;
- Support this effort with training, toolkits, technical assistance, and development of private operator capability;
- Provide incentives for community systems and independent entrepreneurs to bring their systems into regulatory compliance, in a simplified process;
- Test results of automated dispensing and payment system tied to lower-cost projects; and
- Consider special regimes to address the cost of fluoride removal.

Financing:

- Expand the Maji ni Maisha program to include an approach specifically geared to private operators taking equity or loan positions in community systems; and
- Work with commercial lenders to set up financing facilities dedicated to individual high-payback projects, administered under a master arrangement with the WSP.

Enabling Environment

Support the above reforms with simple and transparent messaging about water safety and economics, supporting private investment initiatives.

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