

Innovation in scaling up access to water and sanitation services in Kenya

Briefing note to support innovation in scaling up access of water and sanitation services to urban low income areas

Patrick Nduati Mwangi, Lilian Otiego and Charlotte Ndakorerwa

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List of Acronyms

AMCOW	African Ministers Council on Water
AWSB	Athi Water Services Board
BOD	Board of Directors
CDAs	Community Development Assistants
CDF	Constituencies Development Fund
CWSB	Coast Water Services Board
CoK	Government of Kenya
GPOBA	Global Program on Output based Aid of the World Bank
ICT	Information Communication Technology
IDA	International Development Association
KISIP	Kenya Informal Settlement Improvement Project
KPIs	Key Performance Indicators
KES	Kenya Shillings
LVNWSB	Lake Victoria North Water Services Board
MAWASCO	Malindi Water and Sewerage Company
MEWNR	Ministry of Environment Water and Natural Resources
NCWSC	Nairobi City Water and Sewerage Company
NGOs	Non-governmental organizations
NRW	Non-Revenue Water
NWSC	National Water and Sewerage Corporation in Uganda
OBA	Output Based Aid
O+M	Operation and Maintenance
SPA	Service Provision Agreement
WaSSIP	Water and Sanitation Services Improvement Project
WASPA	Water Services Providers Association
WASREB	Water Services Regulatory Board
WBG	World Bank Group
WHO	World Health Organization
WSB	Water Services Board
WSP	Water Service Provider
WSP	Water and Sanitation Program - Africa of the World Bank
WSS	Water Supply and Sanitation
WSTF	Water Services Trust Fund

Preface

Overview of Technical Assistance

This report summarizes key themes and findings from on-going technical assistance provided to the Kenyan water sector by the Water and Sanitation Program of the World Bank's Water Global Practice. The objective of this technical assistance was to increase access to water and sanitation services by the urban poor in peri-urban areas located in five key Kenyan cities. This objective was achieved through the mapping of low income urban areas, leveraging commercial finance for water and sanitation connections, development of social connection policies for utilities, use of appropriate technology, innovative meter reading and billing approaches as well as through the introduction of output-based subsidies to incentivize utilities to connect Kenya's low-income communities. This report focuses on the innovations that were developed and implemented to improve sustainable access to water and sanitation services for residents of urban low income areas. The innovations covered institutional level work under *social connections policies*¹, a financing mechanism using commercial micro-finance and use of output-based subsidies from the Global Program on Output Based Aid (GPOBA)² and Information Communication Technology (ICT) initiatives using a mobile phone based self-meter reading system locally known as *Jisomee Mita*³.

Background

The pace of urbanization in Africa is unprecedented. Kenya, which has one of the fastest rates of urbanization in Africa, will be among the top five most urbanized countries in the continent by 2020. Although Kenya's Vision 2030 identifies guaranteed access to water and sanitation as one of the key targets, the majority of the population in Kenya's low-income areas, including those living in informal settlements, lacks access to safe and affordable water and sanitation services. It is estimated that over eight million people live in low-income urban

¹ *Social Connections policy* is an institutional policy adopted by a public utility with the aim of subsidizing first-time one-time connection fees to increase the number of low income household connections to the utility's network.

² GPOBA is a global partnership program in the World Bank Group. Through a diverse portfolio of projects, GPOBA funds, designs, demonstrates and documents output-based aid approaches (OBA) to improve the delivery of basic services in developing countries.

³ *Jisomee Mita* is a technical solution to unique challenges of meter reading, revenue collection and customer care in the low-income areas who are beneficiaries of the social connection policy.

>8 MILLION

Estimated number of people who live in low-income urban areas in Kenya.

39% Of low-income households in Kenya have access to improved water sources.

8% Of low-income households in Kenya have access to improved sanitation.

areas in Kenya. Only 39% of low-income households have access to improved water sources and even fewer (8%) have access to improved sanitation⁴. Kenya's new Constitution (CoK 2010) came into effect in 2013, declaring access to water supply and sanitation services a basic human right. This declaration gave urgency to finding solutions to support improved access to water and sanitation services especially for residents of urban low-income residents. Over the years, the Water and Sanitation Program has been providing Technical Assistance (TA) to several cities to support the scaling up of access in the urban low-income areas with Nairobi showing the most progress in adoption of the innovations that this TA is providing. Other cities include Mombasa, Malindi, Eldoret and Mumias.

Features of the Technical Assistance

Innovations for improved access to water and sanitation services by residents in the urban low-income areas have been under development since 2007. This TA supported their implementation and scale up from 2012 in Nairobi. The introductory work on the innovations has started in four other cities in the country. The foundation for the innovations has been the *social connections* approach, which has been institutionalized by the targeted utilities and forms the starting point for all proactive utility-based interventions to support urban low-income areas with improved access to water and sanitation services. Other key elements of the innovations include utility/consumer microfinance and *Jisomee Mita*, the self-meter reading and electronic mobile phone-based billing system.

⁴ MajiData 2015: MajiData: Home, <http://www.majidata.go.ke/>, last accessed 01.04.2015

I. Introduction

This report provides an analysis and summary of the Water and Sanitation Program's technical assistance to five cities in Kenya (Nairobi, Mombasa, Malindi, Eldoret and Mumias) that sought to innovatively scale up access to water supply and sanitation for the urban low income residents.

During the preparation of the International Development Association (IDA) - funded Water and Sanitation Services Improvement Project (WaSSIP) in 2007, the Government of the Republic of Kenya requested the World Bank and the Water and Sanitation Program to support and take lead in the design and implementation of informal settlements interventions in the target cities. It became clear in 2012 that if the proposed approaches being considered, which included water kiosks, commercial latrines, and shared yard taps were to be implemented at scale, then innovation would be required at all levels of interventions' project cycle through a *Social Connections* policy. In addition to the proposed interventions, variations would be required to take into account the different contexts in the cities of Nairobi, Mombasa, Malindi, Eldoret and Mumias.

In addition to the currently ongoing WaSSIP project, other initiatives provided the necessary foundations and support needed to develop the innovations covered by the TA in this report. They include the IDA-funded Kenya Informal Settlements Improvement Project (KISIP),

and the 2011 Nairobi Water Hackathon organized by the World Bank. In the Hackathon event the self-meter reading and billing innovation was developed as a test concept by ICT specialists. The concept eventually won the runners-up position during the World Bank Group (WBG) Innovation FY12 award which was held after the 2011 Water Hackathon event. The Kenya Community Water Microfinance Project, a predecessor project implemented by the World Bank, implemented by K Rep Bank⁵ also provided testing of the innovation for on-lending of microfinance to utility consumers in several cities in Kenya while subsidizing the overall connections' costs using output-based aid (OBA) subsidies.

This report is a review and analysis of the key innovative approaches that were introduced as part of the project identifying the factors for success especially those that can be replicated or scaled up to other similar areas. In addition, aspects that need to be developed further for better success or higher impact are also highlighted.

To illustrate the innovations developed; this report focuses on the Kayole Soweto settlement in Nairobi which houses an estimated 89,000 residents to demonstrate how the three types of innovation were combined to result in improved access for water and sanitation services.

⁵ K-Rep Bank is a leading and fast growing Commercial Bank that targets the Micro Finance sector but also provides a wide range of banking services. K-Rep Bank's mission is to provide exceptional financial services that create value and enrich the lives of our customers, shareholders, employees and the community.

II. Context

Globally, around 2.4 million deaths (4.2% of all deaths)⁶ could be prevented annually if everyone practiced appropriate hygiene and had access to good, reliable sanitation and drinking water. These deaths are mostly of children in developing countries as a result of diarrhea and subsequent malnutrition as well as from other diseases attributable to chronic malnutrition.

In terms of access, the situation for drinking water appears better than for sanitation. Although around 13% of the world's population (884 million people) lives in households where water is collected from distant, unprotected sources, 54% (3.6 billion) receives piped water at home. However, many piped water systems in developing and middle-income countries work for only a few hours per day and/or are unsafe while many other households are dependent on public stand posts. An analysis on data from 39 African countries showed that for 160 million people (most of them women), collection of each container of water took substantially more than 30 minutes^{7,8}. WHO reports suggests that the time lost in collecting water and seeking somewhere to defecate could be valued at USD63 billion annually⁹.

Poor sanitation costs Kenya 27 billion Kenyan Shillings each year, which is equivalent to USD324 million, according to the Economic Impacts of Poor Sanitation¹⁰ desk study carried out by the Water and Sanitation Program. This sum is the equivalent of USD8 per person in Kenya per year or 0.9% of the national GDP while open defecation costs Kenya USD88 million per year. According to the water services regulator, WASREB, sanitation coverage stood

2.4 MILLION

Deaths globally (4.2% of all deaths) that could be prevented annually if everyone practiced appropriate hygiene and had access to good, reliable sanitation and drinking water.

13%

Of the world's population (884 million people) live in households where water is collected from distant, unprotected sources.

USD63 BILLION

Estimated annual value of the time lost in collecting water and seeking somewhere to defecate according to WHO reports

at 73% in Kenya's urban areas in 2013¹¹, which accounts for access to domestic sanitation facilities but not the safe transport and disposal of human waste.

The water sector reforms which started with the enactment of the Water Act 2002 have triggered a transformation in the water sector. The main features of the reforms have been the separation of policy making from regulation, water services provision from water resources management, and decentralization of key functions from the national level to the county level. Water services in urban areas are provided by Water Service Boards (WSBs) at the regional level. The WSBs are in charge of infrastructure construction and report to the national regulator: the Water Services Regulatory Board (WASREB). According to the 2002 reforms, Water Services Providers (WSPs) at the local level are tasked with water services provision through an assets lease arrangement with the Water Services Boards. The devolution of water services to the newly created counties brought about by the 2010 Constitution will enhance the decentralization begun under the 2002 water sector reforms.

⁶ Prüss-Ustün A, Bos R, Gore F, Bartram J (2008) Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health. Geneva: World Health Organization.

⁷ WHO and UNICEF (2010) Progress on Sanitation and Drinking Water; 2010 update. Joint Monitoring Programme for Water Supply and Sanitation.

⁸ Fry RK (2008) Incorporating water quantity into the water access indicator: the effect on estimates of 'adequate' access to water for health in Sub-Saharan Africa. [MSc dissertation]. London School of Hygiene & Tropical Medicine.

⁹ Hutton G, Haller L, Bartram J (2007) Global Cost-Benefit Analysis of Water Supply and Sanitation Interventions. J Water Health 5: 481–502.

¹⁰ Economic Impacts of Poor Sanitation in Africa, The Water and Sanitation Program, March 2012

¹¹ IMPACT, A Performance Review of Kenya's Water Services Sector 2012 – 2013, Issue No.7, Water Services Regulatory Board, 2014

2.1 Kenya's Constitution 2010 and Vision 2030

The Constitution of Kenya (2010) provides a special opportunity to shift the water and sanitation sector to new scales of efficiency and service delivery. Most fundamentally, the Constitution recognizes access to safe and sufficient water and household sanitation as a basic human right while assigning the responsibility for the provision of these core services to 47 newly established counties.

Kenya's vision for the water sector is to "ensure water and sanitation availability and access for all by the year 2030".

According to Vision 2030, the main consumers of water are industries, agriculture, energy production and domestic consumption, in that order. The projection is that the use and demand for water will increase to unprecedented levels as a result of increased urbanization and population growth which is estimated to increase at a rate of 10% per year in the Nairobi Metro area¹².

In this regard, ensuring the availability and access to water for the various competing demands is paramount to secure the human rights as enshrined in Kenya's Constitution.

2.2 Low-Income Settlements in Kenya

Nairobi has experienced one of the highest growth rates of any city in Africa, currently growing at a rate of 4.1%. Since its foundation in 1899, Nairobi¹³ has grown to become the second largest city in the African Great Lakes, despite being one of the youngest cities in the region. It is estimated that Nairobi's population will reach five million in 2025. The rapid urbanization in a developing country like Kenya comes with many challenges related to the provision of adequate housing, water, sanitation, health and education facilities. The challenges, if not addressed, result in the growth of unplanned low-income settlements.

In Kenya, there are approximately 2,000 urban low income settlements¹⁴. It is estimated that approximately eight million people live in these settlements and that 52% of all

low-income settlements are unplanned.¹⁵ In Nairobi, there are 210¹⁶ informal settlements housing an estimated 60% of the city population. These settlements can be categorized into two types: (i) poor settlements in unplanned areas, and (ii) those that arise out of illegal sub-divisions of either government or private land. Most of these settlements are characterized by lack of access to secure, adequate and affordable water and sanitation services, insecure land tenure, lack of adequate housing, low income environmental conditions, and high crime rates (UN Habitat, 2008).

Rapid growth of informal settlements in the city of Nairobi can be attributed to a number of factors including increasing income inequalities and urban poverty, increasing rates of rural-to-urban migration, inefficient land markets, lack of housing market finance for different income levels, high costs of urban living, and low investment in low-income housing.

At the same time, informal settlements are the hub of a robust informal sector that fuels Nairobi's economy — a sector whose share of the labor force grows every year. The share of informal economy jobs was estimated at 45% in 2010 for the city of Nairobi¹⁷. This informal economy is closely linked to the city's commercial enterprises, with the wages of formal economy workers paying for many informally produced goods and services.

In view of the rapid population growth and ever increasing demand for safe and affordable water, many water service providers (WSPs) are struggling to keep up with the demand of supplying quality water consistently. By 2006, an estimated 19% of Nairobi city's low income areas had access to household piped water¹⁸. In Nairobi's informal settlements, only 1.5% of households have improved sanitation facilities, compared to 8% of households in planned low-income areas.¹⁹

¹² MajiData 2015: MajiData : National level: Low-income areas and population (1), <http://www.majidata.go.ke/national.php?MID=Ng==>, last accessed 01.04.2015

¹³ MajiData 2015: MajiData: Nairobi: Low- income areas and population (1), <http://www.majidata.go.ke/town.php?MID=MTE=&SMID=MTM=>, last accessed 01.04.2015

¹⁴ Kenya economic report 2013, Page 30 by Kenya Institute for Public Policy Research and Analysis (KIPPR)

¹⁵ Kenya Inside Informality: Poverty, Jobs, Housing and Services in Nairobi's Slums, World Bank, May 2006

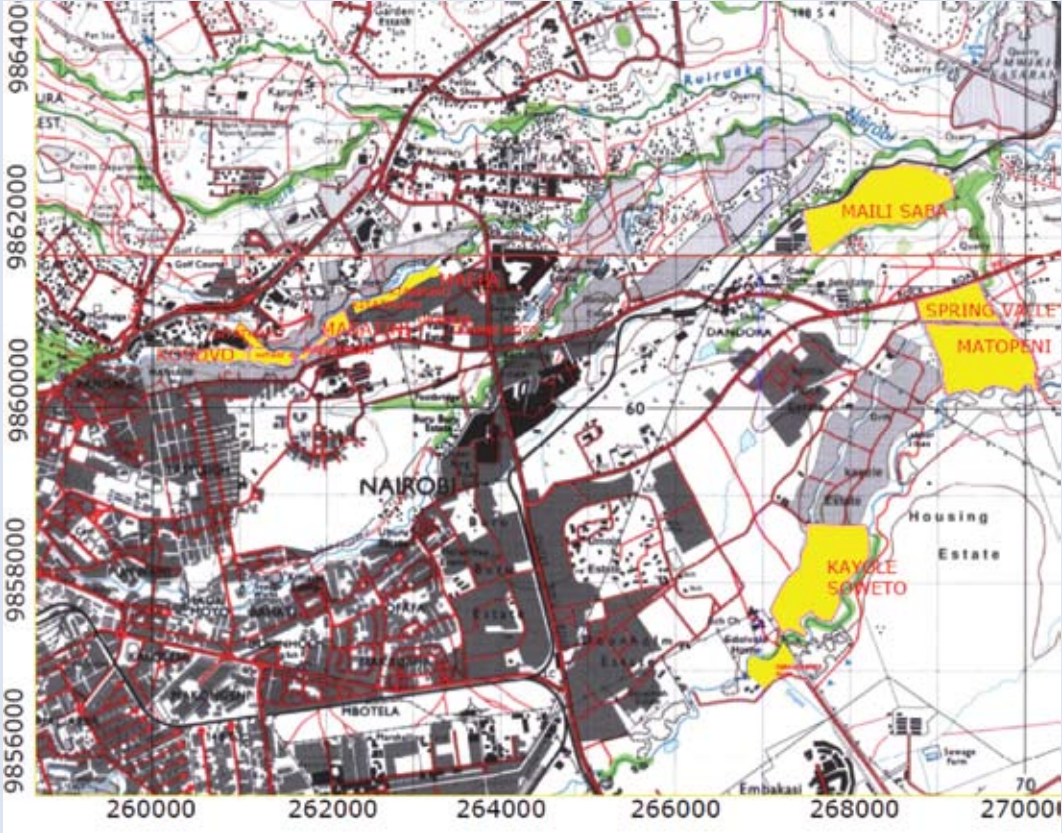
¹⁶ MajiData 2015: MajiData: Nairobi: Sanitation indicators, <http://www.majidata.go.ke/town.php?MID=MTE=&SMID=MTM=>, last accessed 01.04.2015

¹² Government of the Republic of Kenya (2008). Nairobi Metro 2030. Page 22.

¹³ Nairobi City, Encyclopaedia Britannica, Sept, 2013

¹⁴ MajiData 2015: MajiData : National level: Low-income areas and population (1), <http://www.majidata.go.ke/national.php?MID=Ng==>, last accessed 06.05.2015

FIGURE 1: LOCATION OF KAYOLE SOWETO AND OTHER LOW INCOME AREAS TARGETED BY THIS PROJECT IN NAIROBI



III. Kayole Soweto Settlement

The Kayole Soweto settlement is located in Embakasi bordering Komarock Estate in the eastern part of Nairobi. Residents trace its origins to a Presidential order in 1976 to relocate from what is now the Embakasi Barracks. Before re-settling the residents in 1978-1979, the then Nairobi City Council and the military team of surveyors conducted land use planning and sub-divisions, providing for markets, schools, hospitals, etc. The residents were issued with land allotment cards permitting them to conduct developments on the land. However in 1981, residents of other settlements moved to Kayole Soweto Village. Today, the 20-acre piece of land is densely-populated with an estimated 89,000 inhabitants distributed in about 2,300 households.

There are about 8,000 residential structures with an average of two 10ft by 10ft rooms. The ratio of structure owners-tenants is 1:10, and monthly rents vary from KES300 to 1,800 (USD3.3 to USD20) based on the quality of the house and services.

3.1 Access to Services

Water is available at about 35 stand posts across Kayole Soweto managed by the water meter owners, who sell water in 20-litre containers at Kenya shillings 2 or 3 (2 to 3 US Cents). Water vendors sell water by the jerrican for Kenya shillings 2 to 5 each, but the price can rise above Kenya shillings 15 in times of scarcity²⁰. The settlement lacks sewer lines, but there are over 200 household pit latrines built and maintained by the structure owners for use within their allocated properties. There are a number of public latrines, which charge KES5 (5 US cents) per use.

89,000

Estimated inhabitants distributed in about 2,300 households on the 20 acre Kayole Soweto settlement.

²⁰ The Limits and Possibilities of Prepaid Water in Urban Africa: Lessons from the Field, Page 4, Chris Heymans, Kathy Eales and Richard Franceys, August, 2014.

There are open drainage channels maintained by the residents but which are prone to blockage by solid wastes whenever it rains resulting in an increased risk of flooding. A garbage dumping site is available, but some waste is disposed in the nearby Ngong River and in the drainage channels.

Kenya Power and Lighting Cooperation (KPLC) has been extending electricity supply, but illegal power connections from private meters remain common.

External road access is good but encroachment by structures has restricted the internal pathways. The settlement's designated social spaces have been converted for residential use, while neighboring estates provide access to schools, churches, a mosque, and community center constructed with support from the Constituencies Development Fund (CDF)²¹. Children attend the free Mwangaza and Kayole primary schools in the nearby Kayole estate, Outpatient health care services are provided by private clinics and the Kayole dispensary.

3.2 Economic and Social Activities

Kayole Soweto residents earn on average KES12,000 (USD128) per month, most residents engage in casual unskilled and semi-skilled jobs, or self-employment in small-scale enterprises. Some residents are employed in the formal sector, but high Unemployment and crime rates are of concern in Kayole Soweto.

Village elders and the area assistant chief of Kayole Soweto oversee the security and administrative concerns. Residents have benefited from development initiatives undertaken by the Catholic Church, Baptist Church, Kenya Network for Women with Aids (KENWA) and Constituencies Development Fund (CDF).

²¹ Kenya's CDF is a national fund consisting of moneys of an amount of not less than 2.5% (two and half per centum) of all the national government ordinary revenue collected in every financial year disbursed by the national government to constituencies as a grant to be channeled to constituencies, The Kenya Gazette Supplement, The Constituencies Development Fund Act, 2013, Part II, Article 4

IV. Innovations developed under the technical assistance

As a result of the technical assistance covered in this report, three innovations were developed and implemented in Nairobi's Kayole Soweto settlement. The social connections policy is currently undergoing adoption in other settlements of Nairobi in addition to low-income settlements in Mombasa, Malindi, Eldoret and Mumias. In Kayole Soweto, these innovations are at an advanced stage of development and implementation. These innovation areas are as follows:

- Social connection policy implemented through the Nairobi Water and Sewerage Company's (NCWSC) *Maji Mashinani* program (water at the grassroots),
- Financing and microcredit schemes provided by K-Rep Bank commercial banks which used output-based subsidies, and
- *Jisomee Mita* implemented by NCWSC using mobile phone technology

4.1 The Social Connections Policy Approach

This policy champions the right of access to affordable water services on a non-discriminatory basis, especially for disadvantaged or marginalized groups. *Social Connections* is a term used to refer to subsidized private first-time connections of residential dwellings to public utility networks, primarily intended to benefit the low income areas.

The policy provides for subsidizing first-time connection fees but not consumption. It can be financed either externally or internally using utility own finances and follows a specific procedure for implementation, as will be elaborated below. Several African utilities have already implemented similar policies. Examples of these utilities include service providers in Burkina Faso - Office National de l'Eau et de l'Assainissement (ONEA) and Senegal - Senegalaise des Eaux (SONES/SDE). These policies were funded through external funds while those who have adopted internal financing include Societe de Distribution d'Eau de Cote d'Ivoire (SODECI) in Cote d'Ivoire; National Water and Sewerage Corporation (NWSC) in Uganda, Morocco and Gabon also implemented social connections.

Why a Social Connection Approach in Kenyan WSPs?

The Constitution of Kenya, 2010 stipulates that water supply and sanitation service is a human right and the provision of water and sanitation services, including storm water management, is the function of county governments. According to Chapter 4 in the Bill of Rights (Article 43), rights include the right to a clean and healthy environment, the right to reasonable standards of sanitation, and the right to clean and safe water in adequate quantities.

The Kenya Vision 2030 also aims to ensure that "*improved water and sanitation are available and accessible to all*" by the year 2030. African Ministers Council on Water (AMCOW) Country Status Overview report (2011) estimated that water and sanitation access in Kenya is at 59% and 31% respectively; with a majority of the unserved population being the low-income and marginalized. As mentioned, access to water and sanitation services is even worse in unplanned urban areas.

In the urban areas, low-income people not being connected to the public network pay more for a cubic meter of water. While a cubic meter of water costs up to KES1,000, the first cubic meter of water only cost KES18.70 through an individual NCWSC water connection. Additionally, residents in informal settlements do not receive water often. In Kayole Soweto, households receive water only for one day a week. Many have to cover long distances in order to fetch water for which they pay up to KES750 per cubic meter (or up to KES15 per jerrican). The water bought at illegal water kiosks is often of poor quality. This leads to high susceptibility to disease and to less productivity, especially for women who are traditionally responsible for fetching water.

Historically, water and sanitation service providers have not ventured into the low-income areas and informal settlements areas due to wide-ranging challenges. Some of the reasons include:

- Congestion and lack of water supply and sanitation (WSS) networks in the settlements
- High costs of connection
- Unplanned nature of the settlements
- Tenure insecurities
- Exploitive local cartels
- Insecurity and risk of vandalism on infrastructure and theft of meters.
- Residents in low income areas including informal settlements are deemed as high risk with low returns on investments

The implementation of the *Social Connections* policies in Kenya was informed by the realization that one of the best ways to improve water services in low-income areas is often to provide them with access to a reliable supply through a piped network, either through a domestic connection (in the house or in the yard) or through a public stand-post connection. Thus, the application of this policy by the WSPs is an attempt to address the existing inequalities and perceived barriers to WSS service provision. The approach attempts to increase access to water by increasing affordability of connection costs while increasing the utility customer and revenue base. Other benefits that accrue to utilities and communities include use of quality pipes and other materials (which also contribute to the reduction in non-revenue water); weakened water vendor cartels; improved environmental sanitation and hygiene; reduced time taken to fetch water from communal points; improved price of water; improved water quality; reduced risks of waterborne illnesses and increased affordability of initial connections.

Social Connections Implementation in Selected WSPs in Kenya

The two IDA-funded projects, WASSIP and KISIP provided financing to Athi Water Service Board (AWSB), Coast Water Services Board (CWSB), and Lake Victoria North Water Services Board (LVNWSB) for WSS infrastructure investment in their areas of jurisdiction. With the support of the Water and Sanitation Program, water service providers in Nairobi, Mombasa, Malindi, Mumias and Eldoret are implementing social connection policies which will provide access to WSS services to low income and the informal settlements' populations.

FIGURE 2: WATER SERVICES BOARDS IN KENYA



This report focuses on the experience of implementing the Social Connection Policy in Nairobi City. NCWSC adopted a *social connection* policy with the assistance of the Water and Sanitation Program in 2011. The policy which is in line with the Athi Water Services Board's Informal Settlements Policy, and the *Strategic Guidelines for Improving Water and Sanitation Services in Nairobi's Informal Settlements*²², will ensure that there is improved access to clean and safe water in adequate quantities at the household level in Nairobi's informal settlements and low-income areas.

The implementation of the policy will provide subsidized first-time connections for domestic water and sewer for people living in Nairobi's informal settlements and low-income areas. In the past, connection fees were a major hurdle for Nairobi City Water and Sewerage Company to connect the poor directly to the company's network, and

²² Strategic Guidelines for Improving Water and Sanitation Services in Nairobi's Informal Settlements (2009)

this policy will assist in eliminating the need for households to depend on water vendors and cartels who sell water at exploitative prices under unhygienic conditions. The policy provides guidelines related to the social connection fund, roles and responsibilities, eligibility, utilization of the funds, and, tariffs and connection fee.

Social Connection Policy Implementation and the Resource Implications: The Case of Nairobi

Adoption of the social connection policy in Nairobi began with the development of the Athi Water Services Board (AWSB) *Pro-Poor Policy* in 2007. In 2008, NCWSC and the asset-holding entity - Athi Water Services Board (AWSB) developed and adopted the *Strategic Guidelines for Improving Water and Sanitation Services in Nairobi's Informal Settlements*. The guidelines steered the AWSB, NCWSC and other stakeholders towards planning and carrying out a more systematic approach to improve water and sanitation services in informal settlements. Among the key approaches proposed within the guidelines was the technical capacity building of utility staff working in the informal areas and the development and implementation of social connection programs. Subsequently, in 2008 NCWSC established an informal settlements department which had the responsibility to implement projects in informal settlements and had staff representation at the headquarters and in the regional offices.

NCWSC management ensured a sustained human and financial resourcing of the department with an operational budget and specifically developed performance contracts. Strengthening the capacity of the staff in the informal settlements department ensured a proper skill mix of the team which included sociologists, engineer, surveyor, technicians, meter readers and community development assistants. The staff were facilitated to undertake structured learning and knowledge exchanges through several benchmarking exercises with other regional utilities and specialized skills training courses. AWSB also committed staff to the informal settlements who were instrumental in funds mobilization and in collaboration with NCWSC, planned and executed WSS improvements.

In 2011, NCWSC developed and adopted the Social Connection Policy. Upstream work to facilitate the policy implementation included social economic assessments and baseline surveys and mapping of existing infrastructure. These were done to obtain data on household incomes, expenditure, willingness and ability to pay and costs of trunk extension needs. The data collection was necessary to guide the utility in designing an approach that suits the fluctuating incomes of self-employed and informal sector earners. Technical designs which incorporated existing knowledge and the detailed baseline survey findings were developed and planned infrastructure, hardware interventions and detailed cost estimates were prepared to facilitate the implementation of the social connections program in Kayole Soweto Nairobi which began in July 2011.

To roll out the social connection policy, a local NCWSC office was established in Kayole Soweto settlement. The office was instrumental in mobilizing and sensitizing Kayole Soweto residents about the benefits and implications of signing up for a social connection, receiving customer applications for social connections, providing customer care, developing and communicating on the rationing schedule, and adjusting water pressure in the network to ensure that households receive water.

Criteria for Implementing a Social Connection Policy

Several steps preceded the implementation of the social connection policy in Kayole Soweto.

- (i) A **socio-economic and financial analysis** was conducted. It assessed project beneficiaries, beneficiaries' ability and willingness to pay as well as possible constraints to implementation, such as tenure issues. The analysis provided critical information for project planning and implementation. With this information, NCWSC was able to estimate the costs of implementing a social connection policy in Kayole Soweto.
- (ii) One barrier to improve access to WSS in low-income areas and informal settlements was the lack of **adequate infrastructure**. WSPs needed to evaluate access levels, availability and condition of WSS networks, cost of connection and ongoing network expansion projects. This helped the utility assess the level of investments needed.

- (iii) **Water availability** was also important to implement social connections. Many parts of Kenya are water scarce. Under-investments in the water sector have also led to increased water scarcity. Most WSPs had water rationing programs in place in order to attempt to meet the ever increasing demand for water. Before an area was eligible for social connections, WSPs needed to include them in the rationing program to ensure equitable service delivery. In some instances, beneficiaries were skeptical of signing up for a social connection if water provision could not be guaranteed. Ensuring water availability helped overcome this skepticism.
- (iv) Based on the results of the socio-economic and financial analysis as well as the assessment of adequate WSS infrastructure and water availability, the water service provider made an informed decision on **the selection criteria** for target settlements, beneficiaries and modes of payment. These criteria allowed the water service provider to draft its social connection policy.
- (v) In Kayole Soweto, a **local NCWSC office** was established. This office developed a rationing schedule, adjusted water pressure in the network to ensure that households applying for a social connection receive water. The presence of a local NCWSC office in Kayole Soweto was crucial in rollingout the social connection policy. The office receives applications for social connections and provides customer care. The office works closely with the community leaders to mobilize and sensitize Kayole Soweto residents about the benefits and implications of signing up for a social connection. The experience of implementing the social connection policy in Kayole Soweto shows that it was essential to provide office furniture and other amenities to allow staff to work effectively. The budget of the Kayole Soweto office was increased and additional staff members were deployed, especially sociologist and community development assistants that supported community engagement which was primordial for the success of this policy.

- (vi) **Coordination with city planning authorities** was paramount in order to harmonize technical designs with survey plans and avoid land ownership disputes. NCWSC established an NGO coordination secretariat requiring projects to share work plans to help harmonize work plans and help the Informal Settlements Department to plan and coordinate construction works.

With the existence of the water network, 2,200 plots (89,000 people) were connected in Kayole Soweto to the water network through a social connection policy. The policy has significantly benefited the community as well as NCWSC. Residents in the settlement now have access to clean, affordable water and no longer need to cover long distances to fetch water. NCWSC was able to expand its customer base and collect revenues from the new connections in Kayole Soweto. With the implementation of the social connection policy, NCWSC has taken up expanding of services to the urban poor. Additional low-income areas will benefit from social connections where KISIP and WASSIP are supporting WSS infrastructure extensions. NCWSC is in the process of replicating the *social connections* in Matopeni Spring Valley and Riverbank settlements (*see Annex I: Nairobi's targeted low-income areas under this TA*).

In addition to the 25 kilometers of water network, 30km of sewer networks are under construction in Kayole Soweto settlement. It is planned that the community will be able to connect to the sewer network through the social connection policy, once the construction is complete.

The Water and Sanitation Program is also supporting leveraging of additional financing from the domestic private sector (commercial banks) and from GPOBA that provides subsidies to facilitate household connections under the social connections policy. Utilities decide how to finance the social connection policy. While NCWSC set up a social connection fund that receives 0.5% of the utility's total revenue, the Malindi water service provider is financing the policy through contributions from the community and the utility's corporate social responsibility allocations. The financing mechanism for the social connection policy will be further elaborated under Section 5.2.

Other Kenyan utilities are currently at the initial stages of implementing a social connection policy. Malindi Water and Sewerage Company (MAWASCO) *social connections* policy was approved in 2014 by the Board of Directors. The utility is currently implementing a *social connections program* in Kisumu Ndogo and Mida Matsangoni settlements aimed at servicing 55,000 people. Under the policy, the cost of materials and labor is being financed through the accumulated customer fixed deposit account and recovered from the customer through instalments over a period not exceeding 24 months. In Mombasa, the utility aims to connect 32,578 beneficiaries in various low-income areas and is at the project preparatory stage; the Mombasa Water and Sewerage Company Social Connection Policy were also approved in 2014. The WSPs in Mumias and Eldoret expect to gain 5,206 and 14,000 new customers respectively through their social connection policies; both utilities are at the project preparatory stage.

Coping with limited water supply in Kayole Soweto

The current estimated water demand for Nairobi is 650 000 m³/day compared to the production of 482 940 m³/day²³. Due to the shortage, water supply to the newly connected residents of Kayole Soweto is rationed. Each of the nine



Plate 1: Household water connection at Kayole Soweto low-income settlement, *Water and Sanitation Program 2015*

zones receives water once a week. In order to cope with the limited water supply, residents of the area use different methods as listed below:

- (i) **Water Storage:** Individual households store water in containers, usually 20 liter jerricans (the containers purchasing costs range between KES 100 and KES 150 or USD 1.1 and USD 1.6). Because of the size of the houses, usually one-roomed, most households have limits to the number of containers they can keep. A

TABLE 1: NETWORKS FOR SOCIAL CONNECTIONS AND OTHER SERVICES SUPPORTED LOW-INCOME AREAS OF NAIROBI, MOMBASA, MALINDI, ELDORET AND MUMIAS

City/Town	Target Population	Costs Estimate (KES Millions)	Costs Estimate (USD Millions)	Scope of Works
NAIROBI	122,001	656	7.72	24.9km water pipelines, 70.2km sewer lines and 16,000 water and sewer connections
MOMBASA	97,734	265	3.12	28.82km water pipelines, 38 yard taps, 10 ablution blocks, and 570 household water connections
MALINDI	102,153	403	4.74	49.85km water pipelines, 21 water kiosks, 30 yard taps, 17 ablution blocks, 4 waste water treatment plants and 590 household water connections
MUMIAS	20,822	68	0.8	6.6km water pipelines, 3 water kiosks, 2 ablution blocks and 100m sewer line water connections being planned
ELDORET	59,668	111	1.31	33.8km water pipelines, 2 water kiosks, 16 ablution blocks and 70m sewer line water and sewer connections being planned
TOTALS	402,378	1.503 Billion KES	17.7 Million USD	

²³ Kenya Water Resources Management Authority (WARMA) Report, 2010

few landlords have installed water tanks (of between 1000 to 4000 liters). This situation is mainly due to the prohibitive high costs of purchasing such tanks. (For example a 1000 liters tank costs KES11,000 or USD120).

- (ii) Rain water harvesting: Some landlords have fixed gutters to the iron sheet roofs to enable water harvesting during rainy seasons. The rain water is mainly used for cleaning purposes.
- (iii) Use of wells and borehole water: Residents in Kayole Soweto use borehole water mainly for cleaning. The water contains high fluoride levels making it less preferable for consumption. Borehole water is mostly used over the weekends as the Utility does not supply water to the settlement during this period.

4.2 The Innovative Financing and Micro-credit Scheme in Nairobi

The objective of the innovative financing and micro-credit scheme was to increase access to and efficiency of WSS in Kenyan informal settlements as well as to provide NCWSC with innovative access to finance. Small water infrastructure projects were financed through micro-finance and community equity that were subsidized through an Output Based Aid (OBA) subsidy with the conditionality of putting in place metered water connections and yard taps. OBA is a results-based financing mechanism that provides monetary incentives to utilities to expand basic services. In this case, the purpose was incentivizing NCWSC to connect 2,200 households to their water network. The OBA subsidy was transferred to NCWSC once the agreed result had been achieved. NCWSC in turn transferred the subsidy to the connected customers.

Situation in Kayole Soweto before the innovative financing and micro-credit scheme

Residents in Kayole Soweto largely depended on water from the boreholes located within the area. During times of insufficient supply, water vendors sourced water from the neighboring estates selling water between KES15 and KES20 (USD0.16 and USD0.21) for a 20 liter jerrican. According to a socio-economic survey done in 2011, the average income for Kayole Soweto residents is KES12,000 (USD128) per month of which 5% is spent on water

related expenditures. Water expenditure includes the cost of purchasing water, mainly from water kiosks and vendors²⁴.

A willingness to pay study also revealed that 81% preferred having improved levels of service through a household water connection. However, NCWSC's connection requirements include paying a connection fee. This was a major barrier to accessing improved water services. The average cost for a standard water connection is KES13,215 (USD140). This includes KES5,195 (USD56) for piping and fittings, KES2,500 (USD27) as a domestic connection fee and KES2,500 as a refundable meter rent.

Initially, projects were limited to community managed water schemes. When this TA was implemented, projects that were owned and managed by WSPs became eligible for OBA funds.

NCWSC had received funding from the World Bank IDA Credit –WASSIP- to construct an 18km pipe water network within the 9 zones in Kayole Soweto. However, household connections were not part of the credit. To ensure funding for household connections, NCWSC took a KES10 million (USD106,900) commercial loan from K-rep Bank to pre-finance the 2,200 household water connections. Upon project completion and having met the agreed result of connection 2,200 households, NCWSC received a 40% OBA subsidy that covered half of the K-rep loan, including interest and construction costs. The remainder of the loan is being repaid through affordable staggered amounts passed onto the consumers' monthly bill. To sign up for a social connection, each household had to pay a one-off commitment fee of KES1,648 (USD18) as an equity requirement under the project.

NCWSC connected 2,200 households with a metered water connection and provided safe and reliable water. Box 1 illustrates how the OBA subsidy came into play.

KES13,215(USD140)

The average cost for a standard water connection.

²⁴ WaSSIP Socio-Economic Report – Runji & Partners, 2011

Box 1: HOW OBA SUBSIDY WORKS

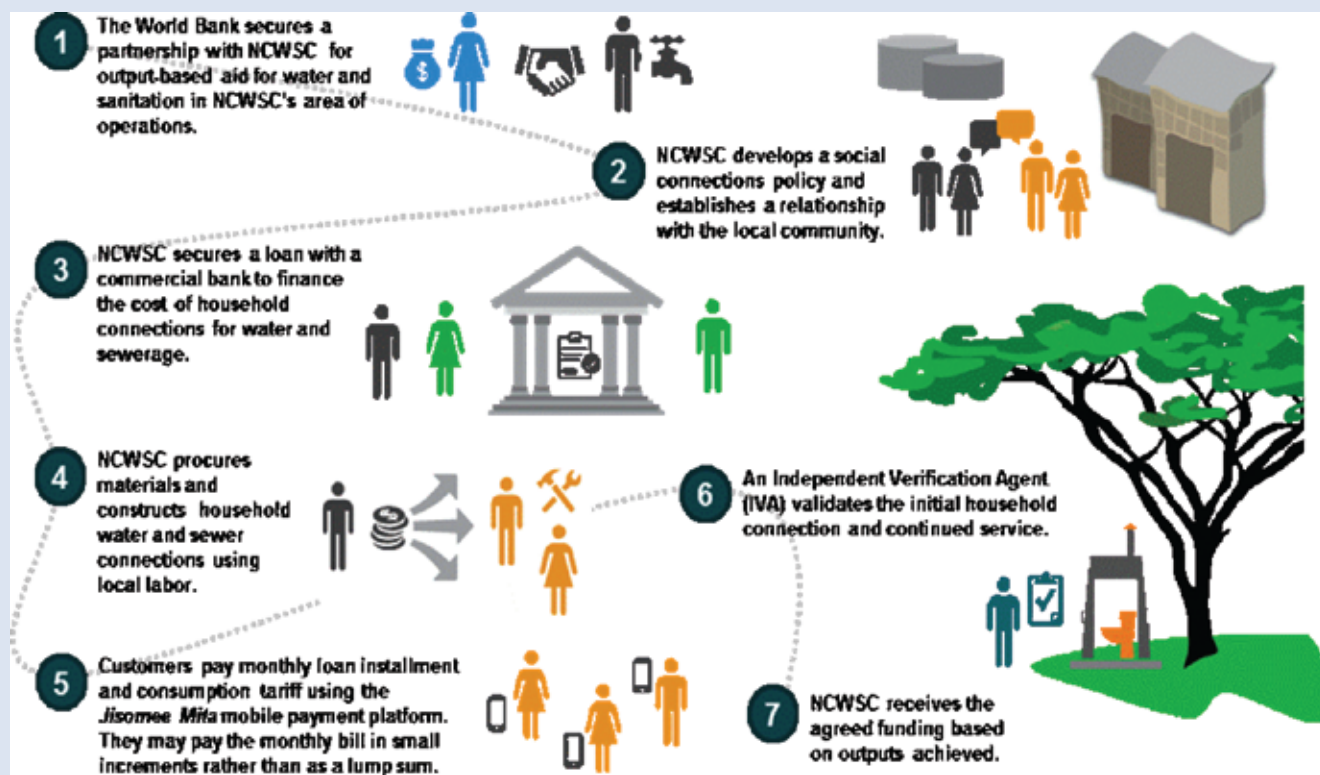


Figure 3 illustrates the financial performance of the project over an 18-month period of analysis. As of March 2015, 306 households had paid off their loan component. The figure illustrates the increase in revenue collection between July 2013 and December 2014. The requirement of loan service was reached in October 2014.

The launch of *Jisomee Mita* has further increased revenue collection. This is because residents were empowered to read their own water meter and pay for their water bills as well as repay their loan installments.

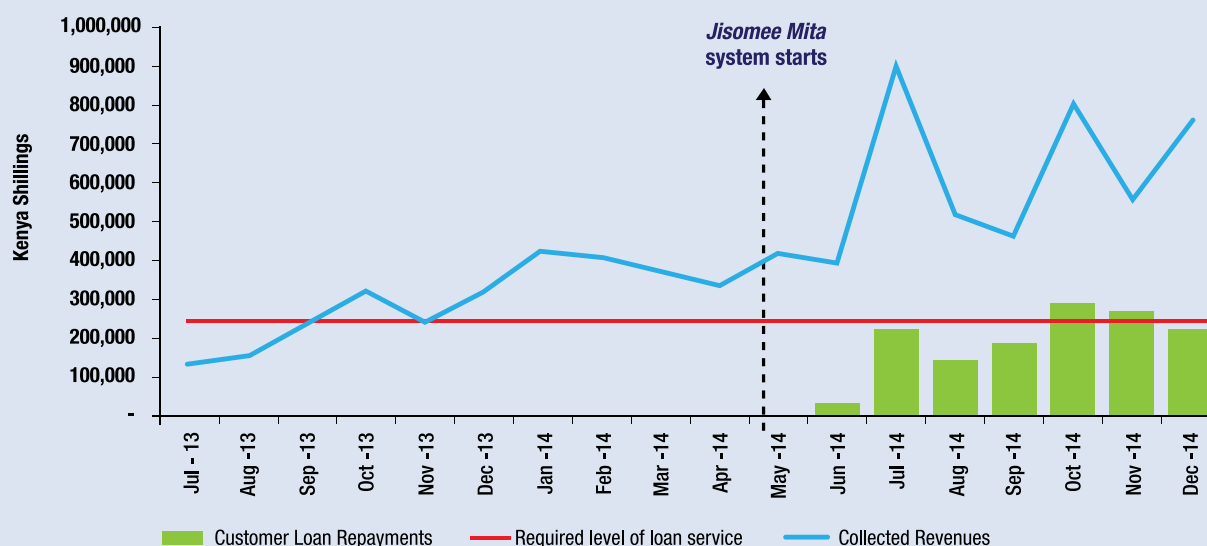
This component of the project was considered successful. For the first time, NCWSC used blended financing: a commercial loan paid for infrastructure investments and the OBA subsidies made water connections affordable for low-income customers in Kayole Soweto who now have access to clean water. Having a pool of competent firms offering

business development services (i.e. feasibility studies, project supervision and capacity building) to support the project is critical.

The Utility's water tariffs are affordable to connected residents of Kayole Soweto. In one of the zones (Mzesa), water bills averaged KES600 (USD 6.6) representing a shared connection for March 2015 (without standing charges and loan component). This is well within the willingness to pay and affordability as outlined earlier in this section. The challenge is on instilling the culture of bill payment to the residents, as well as sustained training / sensitization on use of the self-meter reading and bill payment platform rather than on affordability.

For customers with huge bills which were inherited from the previous system (CMS), NCWSC encourages them to negotiate for payment plans which will enable them clear the pending bills in affordable installments.

Figure 3: KAYOLE PROJECT FINANCIAL PERFORMANCE *1 USD = 90 KES



After this successful project, NCWSC is currently in the process of expanding social connections and scaling up this innovative finance model to more informal settlements through the Nairobi Sanitation OBA project.

Nairobi Sanitation OBA Project

This project, currently underway, builds on the Kayole Soweto model where water supply was provided at the household level through the social connections approach. The expansion of local networks, particularly trunk sewer networks, within Nairobi’s low-income settlements supported by various investments provide an opportunity for improved access to sewerage services at the household level. As was the case for water, the cost of connecting to sewerage networks is too high for low-income households. The socio-economic studies mentioned earlier indicated that there is willingness and affordability to pay for sewerage service, but that connection fees are considered too expensive. The Nairobi Sanitation OBA project will help NCWSC use results-based funds to subsidize the funding gap between the full cost of connection and what the beneficiary households can afford and are willing to pay with a USD4 Million grant. A commitment fee will

be paid by customers signing up for a social connection through an upfront payment/deposit for a sewer and water connection. NCWSC is required to borrow KES600 million (USD6.4 million) to finance the project which is based on the OBA model. This amount covers the cost of connecting 16,000 informal settlement households (80,000 people) in Nairobi to its water and sewerage network over a five-year period. Upon project completion, only independently verified household connections with proof of usage will be subsidized.

NCWSC with the support of invited the local commercial banking sector to bid for financing this project and sensitization workshops and field visits for commercial lenders were held. The evaluation exercise of submitted bids was conducted and NCWSC is currently in negotiation with the successful commercial bank.

4.3 Self-Meter Reading and Billing System

The objective of the self-meter reading and billing system is to empower low-income customer to read their own meters and pay their water bills through mobile money.

It also offers NCWSC many benefits. The concept of the self-meter reading and billing system emerged from the Water Hackathon mentioned in the introduction. NCWSC took a keen interest in improving water services in informal settlements, including moving from paper bills to e-bills and improving the utility's internal billing system. NCWSC's management made the decision to adopt a self-meter-reading called *Jisomee Mita*, meaning "read your own meter" in Kiswahili, as a pilot project in Kayole Soweto.

Through this effort, *Jisomee Mita*, a mobile-to-web platform that allows residents to submit their water meter readings via SMS, check their account number, their water consumption balance, and pay for their water bill - was developed for NCWSC. Simultaneously, the system alerts the consumer on the outstanding connection loan amount for the month allows for progressive payments. The cost of this TA, covered by the Water and Sanitation Program, amounts to USD 50, 000. The software development was based on free, open source technology. NCWSC covers the cost of sending response SMS to customers at 80 cent KES per message, which is cheaper than issuing a paper bill.

In addition, customers use the ICT platform to repay the monthly loan installment under the social connection policy for the water connection using mobile money (*M-PESA*²⁵ or *Airtel's ZAP*²⁶).

Before the introduction of *Jisomee Mita*, the few connected residents of Kayole Soweto relied on meter readers to read their water meters. The bills were issued by NCWSC and sent to customers. Kayole Soweto customers had to walk long distances to NCWSC offices and wait in queues to pay for their water bills. With the introduction of *Jisomee Mita*, the residents now receive their bills on their phones and the water service provider no longer needs to issue paper bills. This is both less costly (paper bills each cost KES100, the equivalent of USD1.2) as well as very convenient when one takes into consideration that most residents in informal settlements do not have access to postal addresses.

²⁵ MPESA - (M for mobile, pesa is Swahili for money) is a mobile-phone based money transfer and micro-financing service, launched in 2007 by Vodafone for Safaricom and Vodacom

²⁶ Airtel's ZAP - Airtel is Kenya second largest Mobile phone services provider and its mobile money system is known as ZAP

It also gives them the ability to check their meter and water bill at any point, for free. Finally, the mobile platforms *M-PESA* and *ZAP* provide customers, who mainly work in the informal sector with irregular income, with the great advantage of a flexible paying arrangement.

Thus, with *Jisomee Mita*, low-income customers are in control of their water consumption and loan repayments. Bills are no longer estimated and the platform is adapted to the socio-economic characteristics of the lives of low-income dwellers, with the flexible payment arrangement and the fact that the platform can be used on any mobile phone. On the other hand, NCWSC benefits through the reduction in costs, as paper bills no longer have to be issued. Through *Jisomee Mita*, the utility now also has a mechanism to recover the loan installments and provide customers with exact bills for water consumption. Since the launch of *Jisomee Mita*, NCWSC is collecting more revenue in Kayole Soweto than ever before.

4.4 *Jisomee Mita* Project Progress in Kayole Soweto

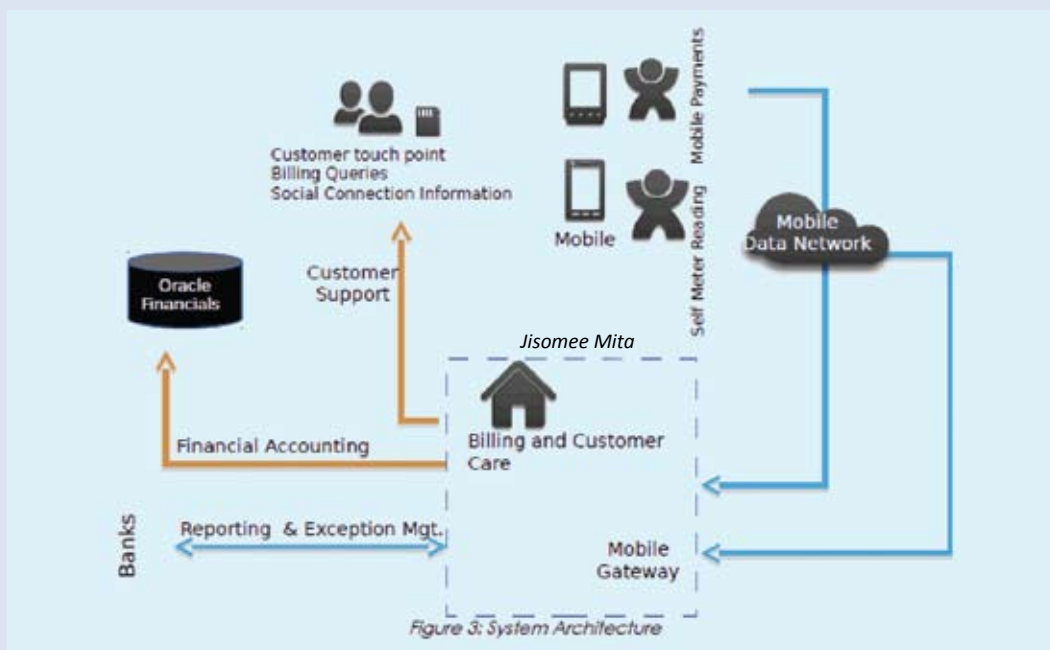
Jisomee Mita was launched in May 2014. To date, 2221 customer accounts have been migrated to the system from NCWSC's Customer Management System. 1300 customers are regularly sending their meters readings and paying their water bill as well as their loan installment. In December 2014, NCWSC collected around KES700,000 (USD7,777) from Kayole Soweto customers for water consumption, compared to an average of KES300,000 (USD3,333) in 2013.

Successes and Challenges

The roll-out of *Jisomee Mita* involved community sensitization and outreach through the help of community development assistants (CDAs). The CDAs were recruited from the youth of Kayole Soweto with the assistance of the Water and Sanitation Program to provide mobile phone use support to the residents of Kayole Soweto. CDAs went door-to-door distributing informational flyers on the new ICT system and training landlords²⁷ (or the caretaker

²⁷ It is the landlords who signed up for a social connection under the social connection policy that now use *Jisomee Mita* to pay their water bills and repay their monthly loan installment.

FIGURE 4: JISOME MITA SYSTEM ARCHITECTURE



responsible for paying the water bill) on the use of *Jisomee Mita*. Customers now feel empowered to be able to control their consumption. They no longer have to rely on meters reader’s visits from NCWSC, or visit NCWSC offices and instead they can now pay in a flexible manner.

At the utility level, trainings were organized for staff, especially customer care staff to familiarize themselves with the functionalities of *Jisomee Mita*. There was some initial resistance to the adoption of a new, unknown and unproven concept. There was also doubt about whether low-income customers have the ability and willingness to read their meters and pay for their bills.

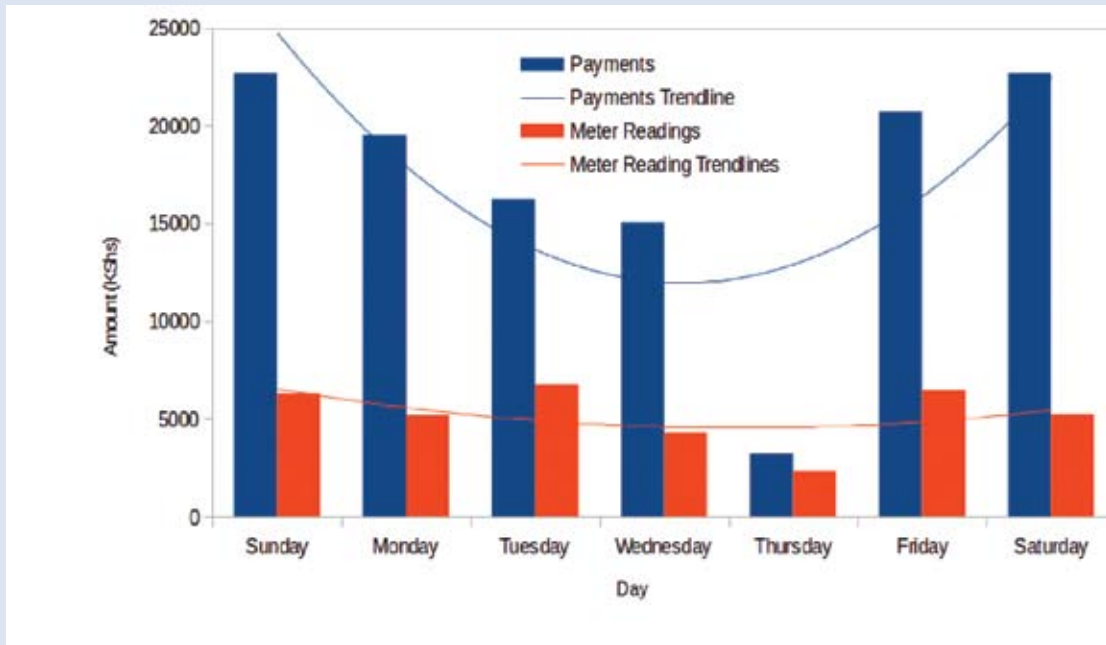
Key for the successful implementation of *Jisomee Mita* was the presence of the local NCWSC office dedicated to Kayole Soweto customers. The office in Kayole Soweto handles water accounts under the social connection policy and customer complaints related to *Jisomee Mita*. The NCWSC Kayole Soweto staff bought into the concept early on and was committed to its roll-out. The good relationship between NCWSC staff and Kayole Soweto residents

also contributed to the acceptance of the system by the customers. The community initially had doubts about the mobile platform. Some community members, especially the elderly and less educated, feared that the payments made via SMS would “disappear” in the network.

A precondition for the roll-out of *Jisomee Mita* was the availability of water. The Water and Sanitation Program has worked closely with NCWSC to increase water service delivery to Kayole Soweto. Residents now receive water three times a week (once a week per zone). This was a crucial factor for the implementation of *Jisomee Mita*. Customers did not want to pay for a service they did not receive sufficiently and frequently enough.

Kayole Soweto residents’ accounts are no longer integrated into the CMS. This creates complications since Kayole Soweto customer accounts are located in a different system. Customer details and transactions are not accounted for in the CMS where all other NCWSC accounts are managed. Furthermore, Kayole Soweto residents can only pay through mobile money and need to read their own meter in order

FIGURE 5: JISOME MITA METER READING AND PAYMENTS WEEKLY TRENDS, WATER AND SANITATION PROGRAM, 2014



to have their water bills issued. Discussions are ongoing about how to address this issue. The options are: integrating *Jisomee Mita* with CMS, upgrading to a new billing system or scaling-up *Jisomee Mita* to become the new billing system for all customers in Nairobi.

Continuous training, communication and outreach were necessary to ensure customers know how to use the system. The system is constantly improved technically. Initially, customers experienced a lot of system downtime. The system was then connected directly to Safaricom and intermediary servers were removed. This has helped improve the stability of the system.

Another challenge that remains is the need for continuous training of landlords on the use of *Jisomee Mita*. The figure above illustrates high payments, especially towards the end of the week. However, Figure 5 also shows that customers do not read their meters as frequently, which is necessary in order to enable customers to be issued with accurate bills. The high payments may also come from the repayment of loans taken under the social connection policy.

The design of *Jisomee Mita* envisaged that it will be integrated into NCWSC Financial Management System, Oracle Financials. All the interfaces are ready from *Jisomee Mita* side. However, the integration process is on-going. In the meantime, the processes are being managed manually pending full integration.

V. Results of the innovations proposition in Kayole Soweto

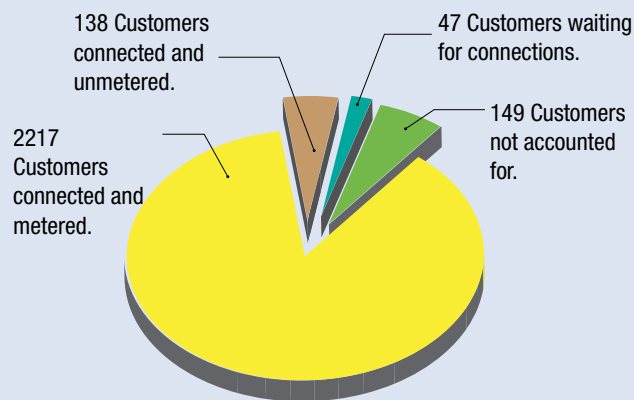
The social connection policy has now made it affordable for Kayole Soweto residents to access piped water through formal connections from the network to communal residences. NCWSC is working to scale up the initiative in several other settlements across Nairobi. In Kayole Soweto, 89,000 residents now have access to household water through household connections under an affordable financing arrangement and sustainable meter reading, billing and payment system. The financial performance analysis from Kayole Soweto reveals that the project is progressing well to recover household water costs funded by the credit from K-Rep Bank. Current collection efficiency has doubled to 102% from 52% since the adoption of the self-meter reading system (*Jisomee Mita*) in June 2014. Loan repayment to K-Rep Bank is also on schedule (see Figure 5 on Kayole Soweto Financial Performance) with over USD 2700 repaid every month from the Kayole Soweto revenue collections which indicate that the *Jisomee Mita* system can facilitate loan repayment in addition to the monthly consumption charges. The NCWSC has been encouraged by the performance of the Kayole Soweto low-income area water supply and this has resulted in the company's seeking a new domestic loan to finance the Nairobi Sanitation OBA project, which will see 16,000 of the city's low-income residents connected to household sewerage and water using the Kayole Soweto model. To date, in response to the Nairobi Sanitation OBA project pre-financing appeal by the NCWSC, five of Kenya's top commercial banks have expressed interest in pre-financing the project with USD6.6 million. Negotiations are ongoing to select the most affordable offer.

Lessons Learnt

The following are the main lessons learnt during the development and implementation of the three innovations during the period under this TA:

- I. Innovations present **opportunities** to improve access to water and sanitation to low-income residents in urban areas. All innovations covered in this report have shown to provide entry points of services provision due to their applicability to the

FIGURE 6: KAYOLE SOWETO WATER CONSUMERS AS OF OCTOBER 2014, (WATER AND SANITATION PROGRAM, 2014)



low-income situation. The social connection policy provided the foundation for improved access to water for low-income customers. In Nairobi, this was achieved by applying an innovative financing method, which taps into commercial financing and OBA. *Jisomee Mita*, the ICT platform, empowers customers by giving them the means of reading their own water meter and paying their bills.

- II. **Water service providers benefit from innovations** such as the ones discussed in this report. These innovations have increased their customer base and revenues.
- III. The innovations mentioned in this report were successful because they took into consideration the **political economy** of low-income areas and informal settlements. Microcredits were provided to low-income customers who are now able to pay according to a flexible payment arrangement and based on their needs.

- IV. The **presence of a local NCWSC office** was crucial. The NCWSC staff members were dedicated and ensured a successful implementation of the social connection policy as well as *Jisomee Mita*. It was crucial to increase financial and human resources to this office. The strong relationship of NCWSC staff in Kayole Soweto with the community built the community's trust in the project as the office deals effectively with customer complaints and provides information on the use of *Jisomee Mita*.
- V. Innovations that require a shift in paradigm take time to develop and implement. The social connection policy, subsidized output-based microfinance, and self-meter reading/billing innovations were developed and implemented over a period of four years. In the case of NCWSC, various stakeholders had to be engaged to buy into the approaches before and during implementation.

The policy, financing, and technology innovations described in the output report have been implemented in Nairobi, with implementation currently on-going in Mombasa, Malindi, Eldoret and Mumias through the water service providers which manage the city-wide water and sanitation public infrastructure. The approach of using existing public institutions provide the opportunity for these innovations developed over a period of three years are institutionalized and can be sustained. However, scale up will require additional support at the policy, finance and mobile support solutions levels.

VI. Recommendations and Way Forward

Social Connection Policy adoption for more water services providers required

The social connections policy approach has been well received and is currently under implementation in the other settlements of Nairobi and four other Kenyan cities. These cities' water services providers have adopted the social connections policy approach to serving residents of low-income urban areas. A new initiative, the Kenya Urban OBA for Urban Low-Income Project²⁸ has adopted the social connection policy as a subsidy provision requirement to improving water and sanitation services. As the way forward, the lessons from this innovation implemented in the five cities will be shared with more water services providers as one of the ways to improve low-income urban areas water and sanitation services. Future support from the Water and Sanitation Program will complement the rollout of the social connections policy to low-income settlements in Nairobi, Mombasa, Malindi, Eldoret and Mumias cities, where water and sewerage reticulation are networks under construction. The support will include the development of a template for adoption by other cities.

Subsidized microfinancing of water and sewerage connections provide a good opportunity for improving access in low income urban areas

Financial analysis presented in earlier sections indicated that the use of output-based subsidies to subsidize loans that provide urban connections to low-income areas is a viable approach for adoption by more water services providers. Commercial banks engaged to date to scaleup the use of this innovation in Nairobi and other cities have expressed satisfaction with the model, which is based on the credit worthiness of the water service providers. Water services providers interested in expanding their services to low-income areas should be supported with technical assistance for the preparation of business plans based on social economic surveys and the institutional debt absorption

capacity. Future support from the Water and Sanitation Program will focus on the leveraging of commercial financing using the two grants provided under the Nairobi Sanitation OBA Project and the Kenya Urban OBA for Urban Low-Income Project totaling to USD16 million. Water service providers will be supported with specialists to assist them in socio-economic studies, designs and business plans for presentation to potential creditors.

Jisomee Mita, Opportunity for Further Business

1. Run as a Pilot, *Jisomee Mita* is ready for the next level

Jisomee Mita was deployed as a solution assisting the collection of water charges (and other miscellaneous recoveries such micro-loans) in informal settlements. Thus, any business case for expansion to other informal settlements has to be informed by a wider decision on the applicability of the principles that give rise to social connections in a particular scenario.

On its own, a billing and customer care system would need to clear the following hurdles in order to stand on its own, regardless of the applicability of a wider social connections policy:

- It has to deliver the lowest price-performance ratio of the alternatives considered,
- It has to be fit for purpose,
- It should be delivered within reasonable time frames,
- It should fit in with the overall strategy of the utility that is implementing the social connection policy, and it should have a relatively short time to go to market. Measured against these metrics, then, a business case for expansion of *Jisomee Mita* to other informal settlements in Kenya can be laid out.

²⁸ Kenya Urban OBA for Urban low income project objective is to increase the number of people in low income areas with access to improved water supply and sanitation services in Kenyan towns and cities by incentivizing urban Water Services Providers to invest in water supply and sanitation improvement subprojects to benefit households in low income areas by applying one-off Output-Based Aid subsidies

2. What is the business case for expansion?

In order to make out a case for expansion, the various costs associated with *Jisomee Mita* have been compiled. The table below shows those costs.

TABLE 2: EXPANSION COSTS FOR THE JISOME MITA MODEL IN NAIROBI

Element	Cost (USD)	Remarks
Software Cost	60,000	Already sunk under the NCWSC Kayole-Soweto pilot
Hardware	3,000	Incremental for blocks of 15,000 customers
Incremental Set-up Costs	15,000	Is not affected by the size of the installation
Annual Maintenance Costs	3,000	Estimated call out charges

In order to calculate the cost of a set-up, one would have to reduce the annual costs to present value. The following assumptions were made:-

- Useful life of the software is three²⁹ years, thereafter needs to be replaced or updated due to obsolescence, business model change, etc.
- Interest rate of 6.875% was applied, this being the yield on Kenya’s 10-year note sovereign bond
- The current inflation rate of 6% holds and will be reflected in the annual cost escalation.

Using these metrics, the NPV of 7 year annual maintenance fees escalating at the current inflation rate is USD19,173.04. Thus the total cost of an installation will be USD37,173. Initial software cost is not included because it is already a sunk cost.

It can thus be concluded that the business case for expansion is made if the present value of the cost of alternatives exceed USD37,173. This is based on purely financial basis. How about other metrics? How do they square up for *Jisomee Mita*?

It is beyond the scope of this document to thoroughly analyse the cost of various alternatives available to a utility. Table 3 gives the various ranges and the probable cost.

TABLE 3: COSTING OF VARIOUS ALTERNATIVES FOR UTILITIES BILLING SYSTEMS

Alternative	Cost Range (USD)	Remarks
No System. Use Excel Spreadsheets	100 - 2,000	Cheap alternative but not always fit for purpose. High risk of revenue leakage and not practical is utilities with more 200 customers
Completely-off the shelf system	1 - 3 million	Can be prohibitive for utilities with low revenue base
Bespoke Solution	50,000 – 1 million	<i>Jisomee Mita</i> is a bespoke system with the R&D costs already sunk

Table 4 shows an analysis of the non-finance based factors.

TABLE 4: NON-FINANCE BASED FACTORS FOR JISOME MITA USE

Factor	<i>Jisomee Mita</i>	Remarks
Price-performance ratio	Very low	<i>Jisomee Mita</i> offers good price performance compared to other alternatives
Fit for purpose	Good fit	Combined with social connections, then there is a perfect fit
Delivery Time-Frames	3 months	Very good
Fit in with the overall strategy of the utility	Varies from utility to utility	This will depend on the utility

²⁹ US Internal Revenue Service (2014), Internal Revenue Manual, Chapter 1.35.6, Property and Equipment Accounting, Accessible on http://www.irs.gov/irm/part1/irm_01-035-006.html

3 Does it make business sense to expand *Jisomee Mita*?

Viewed against other alternatives, *Jisomee Mita* makes business sense. However, the complete analysis has to be made and viewed against alternatives, which is beyond the scope of this analysis. However, the benchmark against which a business case has to be made has been established. Water services providers where a social connection policy WSS reticulation has been expanded to low-income areas and microfinancing of connections is feasible, will be prioritised for the *Jisomee Mita* model implementation support.

Innovations’ adoption incentives for the various stakeholders in Kenya

Table 5 covers the motivation, costs and benefits to the innovations covered under this report for the various stakeholders.

TABLE 5

	Motivation	Cost	Benefit
Utilities	Utilities which are owned by counties are required to provide access to the underserved with water and household sanitation under the Constitution of Kenya 2010	Utilities have to shoulder the financial burden of increase numbers of bottom of the tariff customers with increased operational oversight including meter reading and billing.	Increased number of consumers which in turn increases the revenue base
County Governments	County government have been assigned the responsibility to ensure that there is universal access to water and household sanitation under the constitution of Kenya 2010. County governments need to respond to the large low income voting block by ensuring inclusivity in improved level of access to water and household sanitation.	County governments need to support their utilities to negotiate for funding for increased access to water and household sanitation for low income areas.	Increase numbers of low income residents with improved access to water and household sanitation provide a larger revenue base which improves their utilities’ financial strength.
Commercial Banks	Availability of relatively new sector requiring commercial debt, and able to absorb it, give the banks motivation to engage with lending to water and sewerage utilities.	Banks which do not have robust infrastructure financing departments would need to invest in human resources to undertake due diligence to support the credit risk activities. In any case these innovations covered in this report pose unknown risk that do require resources in Banks to access.	Low income urban residents provide a bottom of the pyramid access for banks to the unbanked part of the population. In addition access to the unbanked provide banks with customer who may need other profitable banking services.

Mobile phone Operators	<p>Similar to Commercial banks, mobile phone operators have motivation to engage utilities to sell services to new ICT – unserved sectors. Some Mobile phone operators do take the opportunity to engage with low income residents to meet their CSR obligations.</p>	<p>Mobile phone operators and their partners have to invest in research and development (R&D) to meet the needs of the new business areas.</p>	<p>Low income urban residents provide a bottom of the pyramid market to mobile phone operators who rely on the large number of transactions-model to make profits.</p>
Low Income Areas Residents	<p>Low income areas residents are motivated to improve their livelihoods status. Improved access to water and household sanitation reduces the day to day drudgery that low income residents face.</p>	<p>Socio-economic studies do ensure that costs to low income residents for water and household sanitation access is affordable. There are however minimal costs to the residents in monetary terms and time that they have to avail for project preparation and implementation.</p>	<p>Benefits include better access to more affordable water of higher quality and potentially more sanitary latrine. Some residents have been reported to have an increased feeling of wellbeing and hope for a better future for their families. Improved security has also been reported especially to the vulnerable members of the low income area community who no longer have to walk distances for the water and sanitation services.</p>

VII. Conclusions

Access to safe water and sanitation in peri-urban informal settlements remains a big challenge because of land tenure disputes, lack of land use planning, technology and financial issues. Meeting the water supply demand and basic sanitation needs for millions of unserved and underserved Kenyans will require a combination of political commitment, engagement of the planning authorities, substantial increase in investments, innovative solutions and business models.

This TA has proven that urban low-income customers are able and willing to pay for services. In the Kenyan context, they are also keen on using ICT tools for more transparency and accountability.

It has also provided instructive insights that could guide the scale up of initiatives in low-income areas such as the ones found in Kenya's large cities. The key aspects that need to be considered include:

- Urban planning.
- Understanding the political economy: low-income communities' financial reality and expenditure patterns.
- Targeted investments, pro-poor policy approach and pro-poor infrastructure development.
- Use of existing public structures and institutions; institutional strengthening, financial and ICT pro-poor innovations and community engagement.

7.1 Low-income Communities' Financial Reality and Expenditure Patterns

Several studies have shown that low-income residents are willing and able to pay for improved water services if it is delivered to them reliably and affordably. However, one of the key barriers for households in accessing a piped network is the initial connection costs. Implementing WSS projects in the low-income areas requires the utility to understand the target communities' financial realities and expenditure patterns. Socio-economic assessments and studies that capture household incomes, expenditure, WTP and ATP data, should guide the utility to design a scheme

that suits the fluctuating incomes of self-employed and informal sector earners. The TA's innovations have made WSS services affordable to low-income households through access to subsidized micro-loans and staggered payment of consumption bills. The low-income households come together to borrow the money needed for the initial cost of installing a metered stand pipe within their residential compound; and can borrow small amounts of money to offset the initial costs connection and, through a flexible payment scheme, repay the loans together with the monthly water bill over an agreed period.

7.2 Planning a Pro-Poor Policy Approach and Targeting Investments

A corporate policy supporting extension of services to low-income settlements is requisite for the success of the projects. A policy approach ensures scalability and provides a channel for internal budgetary allocation or external financing. To target the poor, the geographical targeting approach is applicable in the Kenyan urban setup. For other areas, utilization of the Water Services Trust Fund '*Maji Data*' would be useful. As mentioned earlier, a local presence of the water service provider is crucial at the settlement level. This innovative approach combines a *Social Connections* policy with OBA, provided through the Global Partnership on Output-Based Aid, to enable low-income households to access subsidized micro-loans from commercial banks. The performance risks are taken by NCWSC that is eligible for a partial OBA subsidy of about 50% on delivery of outputs to refinance a part of the loan and keep the debt repayment affordable for poor households.

7.3 Pro-Poor Infrastructure Development and Community Engagement

To increase access to reliable, affordable and sustainable water supply and sanitation services to the low-income areas, utilities need to undertake network intensification activities such as expansion of piped water supply and sewerage network through the extension of primary and secondary distribution pipes. This should be done through a balanced program including the involvement of communities in

decision making and planning. Communities should be consulted before project implementation in order to ensure ownership. Many community members, such as youth groups participated in the construction of the water and sewer networks. This provided job opportunities for the community and leveraged community support for the projects.

7.4 Public Structures and Institutions in Institutional Strengthening

Use of existing institutional structures is required within the devolved water service delivery framework which allocates the responsibility of provision of water and sanitation services including storm water management as the function of county governments.

Within WSPs, a dedicated department and team need to support the utility's activity in low-income areas. Strengthening of the team/department focusing on the low-income areas is essential to ensure the right skill mix and facilitation of the field teams operations.

7.5 Financial, ICT Pro-Poor Innovations and Locally-Available Technology

Various financing mechanisms aimed at supporting efforts to supply improved and affordable water and sewerage services to the low-income areas should be explored. An innovative financing arrangement by commercial banks should leverage additional resources and ensure sustainability and effective use of resources. This TA offers innovative financing arrangement which provide two distinct potential benefits to the urban water sector in Kenya:

1. It leverages additional financing from other players, such as commercial financiers and,
2. It contributes to sustainability and effective use of resources including locally available mobile phones-based systems.

Annex 1: Low-Income Areas Targeted by the Innovations Technical Assistance

City	Total Pop.	Settlements	Pop.	Services	Cost Estimate	Construction Works Description
					Millions USD	
NAIROBI	122,001	Kayole Soweto	89,600	Water	0.5	1.5km water reticulation
		Matopeni/ Spring Valley	15,219	Water		18.7km water reticulation
		Riverbank	3,000	Water		4.7km water reticulation
		Kayole Soweto	89,600	Sanitation	2.3	30km sewer reticulation
		Matopeni/ Spring Valley	15,219	Sanitation	3.1	31km sewer reticulation
		Riverbank	3,000	Sanitation	0.7	6.9km sewer reticulation
		Huruma	14,182	Sanitation	0.7	2.3km sewer reticulation & 4 ablution Blocks
MOMBASA	70,734	Ziwa la Ng'ombe & VoK	48,352	Water and Sanitation	0.8	11.8 km water reticulation, 1 office block, 190 connections, 10 yard taps and 2 ablution blocks
		Maweni	1,628	Water and Sanitation	1.7	8.02km water reticulation, 380 household connections, 20 yard taps and 7 ablution blocks
		Shauri Yako	3,568	Water and Sanitation		
		Kisumu Ndogo	10,098	Water and Sanitation		
		Mnazi Mmoja	5,038	Water and Sanitation		
		Matopeni	2,050	Water and Sanitation		
	27,000	Vikobani	10,000	Water and Sanitation	0.2	4km water reticulation, 2 yard taps, 1 ablution block
		Likoni	17,000	Water and Sanitation	0.3	5km water reticulation and 6 yard taps

MALINDI	102,153	Kisumu Ndogo	8,561	Water and Sanitation	1.1	14.1km Water reticulation and 1water kiosk, 10 yard taps, 190 household connections, renovation school toilet block and construction of office block, 1 wastewater treatment plant
		Kibokoni	3,400	Water and Sanitation	0.9	12.2km water reticulations, 2 ablution blocks, 1 water Kiosk, 10 yard taps, 200 household connections, 1 wastewater treatment plant
		Muyeye Asili	10,686	Water and Sanitation	1.4	9.85km water reticulation, 2 water kiosks, 3 ablution blocks, 10 yard taps, 200 connections, 2 wastewater treatment plant
		Matsangoni	30,000	Water	1.1	6 km Water reticulation
		Maweni	43,506	Water and Sanitation		7.7km water reticulation, 12 ablution blocks, 17 water Kiosk
		Kijiwe Tanga	6,000	Water		
MUMIAS	20,822	Shibale	6,150	Water and Sanitation	0.8	1.45 water pipeline, 2 water kiosks, 1 ablution block, 50 meters sewer line
		Lumino	5,804			731m water reticulation.
		Lukoye	4,921			1.92km water reticulation, 1 water kiosks
		Mjini	3,947			2.485km water reticulation, ablution block, 50mtrs sewer reticulation
ELDORET	59,668	Maili Nne	4,469	Water and Sanitation	1.2	1.8km waterline. 1 ablution block
		Munyaka	5,914			5.2 waterline, 12 ablution block, 2 waterkiosks
		Kimumu	15,100			22km waterlines, 1 ablution block
		Kamukunji	10,186			70 meters sewer line, 1 ablution block
		Huruma	15,023			1.6km waterlines, 1 ablution block.
		Kijiji	3,951			1.7km sewer line
		Silas	5,025			1.5km waterlines

Total Population: 402,378

Investments: 16.7 Million USD

Annex 2: Institutions and Programs involved in this Technical Assistance

NCWSC's *Maji Mashinani* provides a platform that demonstrates the potential of leveraging IDA funds to attract additional financing from other players, such as the International Finance Corporation and commercial financiers.

International Development Association (IDA): Through a concessional lending, IDA is supporting Kenya's *Maji Mashinani* project through a USD150 million channeled through Water and Sanitation Services Improvement Project (WaSSIP) and another USD300 million channeled through Kenya Informal Settlements Improvement Project (KISIP).

Water and Sanitation Services Improvement Project (WASSIP): Through the USD150 million IDA funding, WASSIP is contributing to interventions that are aimed at increasing access to water and sanitation services in Nairobi, Mumias and Mombasa cities, and fast-expanding towns which are experiencing high demand for water, sanitation and other services due to Kenya's rapid urbanization.

Kenya Informal Settlements Improvement Project (KISIP): Through a USD300 million IDA funding, KISIP is pursuing one of its project development objectives that seeks to provide infrastructure in various urban parts of Kenya that are classified as low-income areas. Through collaboration with the Water Global Practice, the Urban Practice, under which KISIP is implemented, was able to develop synergy with WASSIP. In close collaboration with WASSIP and *Maji Mashinani*, KISIP has provided funding for sewer construction in Nairobi (Kayole Soweto), Eldoret (Maili Nne, Munyaka, Kimumu, Kamukunji, Huruma, Kijiji, Silas), as well as in Malindi (Kibokoni, Muyeye).

World Bank Water and Sanitation Program: The Water and Sanitation Program is supporting innovations in scaling up access to water supply and sanitation services for the urban low income in Kenya. The Water and Sanitation Program is providing technical assistance to the project,

by sharpening focus on reaching residents of urban low-income settlements, and also supporting leveraging of additional financing from the domestic private sector and from GPOBA (USD4 million) to facilitate household connections in underserved areas.

World Bank Global Partnership on Output-based Aid (GPOBA): Upon connection to the piped water network, the beneficiaries are entitled to a 50 percent rebate through an output subsidy from GPOBA.

Nairobi City Water and Sewerage Company (NCWSC): the implementing partner which ensures sustainability through institutionalization of the innovative approaches.

Athi Water Services Board (AWSB): the recipient of a sector investment loan from the World Bank. AWSB is also the oversight authority that has issued a Service Provision Agreement (SPA) to NCWSC. The Athi Water Services Board, through the Kenya Informal Settlements Improvement Project (KISIP), is installing sewerage reticulation to low-income areas, including Kayole Soweto. Implementation of 31 kilometers of primary and secondary sewerage networks in Kayole Soweto settlement is estimated to cost KES209 million.

Water Services Regulatory Board (WASREB): The role of WASREB, according to the Water Act of 2002, is to establish guidelines for tariff setting by Water Service Providers (WSPs), in this case NCWSC. Under these guidelines, NCWSC is required to accommodate cross-subsidization in its tariff. By validating the lower domestic charge of KES18.71 (20 US Cents) for the lower domestic consumption block 0-6m³, WASRE B ensures that such a tariff is not only used as an economic instrument, but also a tool to enhance social equity. Under the Social Connections approach used in Kayole Soweto, NCWSC consulted with WASREB to ensure that the Social Connections fee was allowable as per the tariffs structure.

K-Rep Bank: K-Rep bank is a medium-sized, fully licensed commercial and micro-finance bank serving the urban and rural low income in Kenya, as well as financing their small-to-medium business enterprises. For the Kayole Soweto project, the social connection cost is being financed through a loan arrangement with K-Rep Bank working with the Global Partnership on Output-Based Aid (GPOBA) to provide subsidies.

Kayole Soweto Community and its leaders: The NCWSC uses the settlement leadership to mobilize the community to ensure ownership and peer-to-peer policing. This overcomes the mistrust those low-income settlements residents have of authorities due to neglect of several decades.

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Water and Sanitation Program

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