



Accelerating inclusive services for water supply in peri-urban towns in Tanzania

In Singida Municipality, I4ID's introduction of an open-source GIS customer/infrastructure database is enabling the public water utility to deliver improved services to its customers. With major monetary savings being realised, more financing is available to connect unserved households to the water system. Four other water utilities in Tanzania have already adopted the database. Seven more utilities are seeking to develop a similar system.

This case study presents the experiences of the Institutions for Inclusive Development (I4ID) Programme's partnership in improving water supply systems management in the municipality of Singida. It documents the lessons learnt by Palladium, SNV in Tanzania, BBC Media Action, and ODI UK throughout four years of programme implementation (2017-2020). Supported with UKAid and IrishAid funding to address several service delivery and economic issues, the partnership contributed in:

- strengthening inclusivity and accountability practices in Tanzania's institutions for long-term social progress and economic growth; and
- enabling the delivery of equitable services to benefit women, young people, people living in poverty, and vulnerable groups across Tanzania.

The challenge

Around 74% of the urban population in Tanzania's 19 regional cities and Dar es Salaam live in Low-Income Areas (LIAs). In LIAs, an estimated 23% have access to basic water services. People without a functioning water point nearby rely on informal providers who can charge up to 20 times the regulated tariff at times of scarcity.

Tanzania has one of the highest urbanisation rates in sub-Saharan Africa. The growing urban population is settling in towns and cities faster than public water utilities can meet people's need for water. Water supply requires investment in infrastructure and the maintenance of urban networks and independent water schemes, both in peri-urban and rural locations.



The burden of poor water access is often borne by women and girls in Tanzania (SNV/Aidan Dockery)

While water access is a priority for almost all political and community leaders, inefficiencies in investment and operations are exacerbated by political influence.

Most urban water utilities lack comprehensive data on the location of their customers, infrastructure, and assets. Limited access to data hinders the ability of utilities to make informed and cost-effective decisions to maintain, manage, or expand their network to connect additional communities and households. To make accurate costings, and arrive at informed investment decisions, utilities need, (i) sufficient data on the precise layout of their existing network, and (ii) service demand forecasts based on demographic trends and town development plans, to conduct geographic and hydraulic modelling.

Without sufficient and reliable data, utility managers are likely to underestimate costs and pipework requirements (leading to expensive remedial work later) or over-invest in infrastructure (wasting valuable resources). Infrastructure-focused development often leaves decision-makers of urban water utilities and municipalities (councillors) at the mercy of erring contractors who over-specify scheme requirements or make costly mistakes in planning. It also opens up opportunities for the unethical practice of engaging in rent-seeking activities for personal financial gains and benefits.

Furthermore, lack of sufficient and reliable data weakens utilities' ability to engage in dialogue with and counter political influence in investment and operational decisions.

I4IDs engagement

I4ID searched for organisations and people to collaborate with to deepen the programme's understanding of problems and develop and test possible solutions.

I4ID partners found high political interest to improve access to water during the programme design phase scoping. Shortly after, Singida was identified as the locality to inform I4ID's analysis of underlying problems and challenges in water access. Singida Urban Water Supply and Sanitation Authority (SUWASA) was selected due to reports of having a strong and innovative utility leadership.

A water-point mapping exercise, to determine the number and percentage of functioning water points, provided a useful entry point to consult with political, government, and community leaders. The exercise revealed important findings, including:

- huge differences in levels of functionality between central wards managed by the utility and the peri-urban wards under the responsibility of the Municipal Council; and
- significant over-investment in infrastructure in four of the nine peri-urban wards where the number of water points in relation to residents was two to three times that required by the national policy.

Some of these differences were down to local performance issues. But water challenges and shortfalls were mainly due to weak planning mechanisms and rent seeking activities.

I4ID informal consultations with multiple stakeholders revealed that a wider policy shift was underway that would lead to a restructuring of the water sector. Validating the superior performance and capabilities of water utilities, this restructuring would shift greater responsibility for urban water to utilities. Rural water would be managed by a new central Rural Water Agency (RUWASA), doing away with district/municipal responsibility for water.

With these plans in mind, the I4ID partnership focused its efforts in supporting water utilities to manage this transition and expand their scope.

Singida urban water utility, which demonstrated a strong interest and ability to ideate and co-create potential solutions, requested support to develop a model GIS customer and infrastructure database.

Singida Urban Water Supply and Sanitation Authority (SUWASA) proposed to develop its database and GIS platform to enhance its capability for business expansion. Through the database, SUWASA sought to gain insights that would inform its decisions regarding prioritising expansion into unserved areas and to low-income customers.

I4ID supported SUWASA to develop an operational GIS customer and infrastructure management database, and to pilot a replicable model for urban water utilities in Tanzania. Through its work with SUWASA, the I4ID partnership hoped to demonstrate an approach that would enable improved investment decisions for network expansion, customer and revenue management, and non-revenue water management, i.e., leaks and unauthorised connections. And that this would also help the utility to engage more effectively with political actors, and to promote impartial and objective investment and operational decision making.

Through I4ID's strong network of international technical experts and consultants, the partnership sourced an excellent consultant with expertise in

capacity building, GIS database development, and water sector engineering. This mix of skills and know-how made the difference between success and failure.

Systems change approach and results

Scalable cost-effective open-source GIS software and data management system for urban water utilities

The advances made in open-source GIS software in recent years have begun to offer a serious alternative to the main commercial application, ArcGIS. ArcGIS, though sampled by many utilities in Tanzania, could not be maintained because of prohibitively extensive licensing fees. Compared to ArcGIS, open-source software like QGIS is free from licensing fees but requires a little more expertise to set up. Although QGIS does not offer the full suite of functionality ArcGIS offers, and training and technical support that comes with commercial software is limited, QGIS can be made to work with additional open-source plug-ins and software modules.

In addition to the GIS database, I4ID supported SUWASA to develop and tailor support systems for improved, municipality-wide operations and customer management. These systems enabled a better work-flow and more inclusive service delivery:

- A web-based Geoportal for quick data review without additional software except a web-browser.
- An Android-based incident reporting tool for better monitoring and tracking of reported issues and preventing revenue loss through early reporting.
- The same Android app provides a customer portal, improving customer engagement and new water connections requests direct to SUWASA.

This system design, gave the utility a complete picture of operations from paying, metered customers, to leaks and incidents reported.

Developing a pilot with SUWASA was successful in demonstrating a viable model for utility adoption and replication. Shortly after, utilities eagerly wanted to replicate the pilot when they realised just how much they could do with free, open-source software. So far, four utilities have



Many women with children are left with few options to effectively balance the multiple roles of child care and water collection (I4ID/ Neema J. Ngelime)

replicated the model introduced by I4ID. Seven more utilities are developing their own system, similar to the I4ID model.

Satellite imagery mapping of high-density neighbourhoods to connect as many households possible to water supply

GIS allows for accurate identification of high-density populations in unconnected neighbourhoods. Combined with elevation data and GPS locations of assets – such as storage tanks and pumping stations – engineers can accurately compare the costs and benefits of investment options into different communities. Access to comprehensive data and information helps engineers make a rational decision on how to reach the most households with the resources available. Data availability reduces the reliance on guesswork or arbitrary decisions often influenced by powerful elites.

Using the satellite imagery's ability to visualise service coverage area and identify high population areas, the utility decided to invest in the more populous Mandewa ward over Mauninga ward even though existing pipelines were closer to the latter. Hence the number of potential new connections was increased. Within the first year of this investment, 317 households (almost 1,400 people) were connected.

The database also enabled SUWASA to improve its operational planning and efficiency. For example, it enabled more accurate tracing of water leaks which resulted in a 58% increase in water leaks repaired in service lines compared to the previous year.

SUWASA and Singida Municipal Council coordination mechanism established to speed up the process of applying for a new water connection

With the establishment of the new GIS database, SUWASA saw an opportunity to develop a new coordination mechanism to streamline the application process for the approval and installation of new connections. Specifically, SUWASA sought the integration of two stand-alone data sources, the plot survey data held by the Singida Municipal Council, and water infrastructure data held by SUWASA.

I4ID assisted SUWASA in the first round of digitising the survey plots into their GIS database. The I4ID partnership also purchased plot data for Singida Municipality from the Ministry of Lands, Housing, and Human Settlements Development.

Data integration enabled residents to apply for connections directly to SUWASA. This replaced the earlier time-consuming practice of first securing plot survey data from the Municipal Planning

Department, and then applying for a SUWASA connection. In the past, such a process would take many months.

Lessons

At times **technical issues need to be tackled in order to address the underlying political and coordination issues** that contribute to inadequate access to urban water, particularly for the voiceless, people living in poverty, women and girls.

Stretching a broad-based governance programme to really understand and make spending decisions on very sector-specific, technical issues raised an interesting challenge.

I4ID's urban water experience reaffirmed the importance to **identify a public organisation that functions effectively**, despite operating in an environment where effective public service delivery is not the norm (positive deviance). SUWASA's motivated leadership, upward performance, and openness to new ideas were key to the successes achieved.

A locally based set up or organisation provides the ability to understand a partner's needs and capacity gaps on the ground, and to source and manage a targeted technical support intervention from a wide network of local and international experts.

The **importance of engaging in informal political economy analysis**, based on insights and intelligence that can only be derived from relationships characterised by familiarity and trust, as evidenced by the informal consultations with multiple stakeholders which revealed a wider policy shift.

About I4ID

Institutions for Inclusive Development (I4ID) is a programme implemented by Palladium, SNV, BBC Media Action and ODI UK, funded by UKAid and IrishAid. Between 2017 and 2020, I4ID partners piloted new and innovative approaches to introduce inclusive growth approaches and better public services to benefit the largest number of people possible in Tanzanian society.

This case study was put together by staff from the I4ID team, including Julie Adkins (SNV), who edited this brief for SNV.

About SNV in WASH

SNV contributes to sustainable change in WASH delivery systems. Ultimately, we envision a world that enables all people's access to affordable and reliable WASH services – leaving no one behind.

In households, schools, and health facilities, our programmes are designed to build professional, organisational, and inter-institutional capacities to deliver environmentally and financially sustainable rural and urban WASH services. Through programme implementation, joined-up thinking, and our research – conducted with partners in government, private sector and civil society – our contributions:

- provide evidence to integrate sanitation information in wider district-, provincial and city planning;
- assist public authorities to better target investments and oversee the efficient operationalisation of services;
- create the conditions and capacities for private sector engagement in WASH; and
- instil long-lasting sanitation and hygiene behaviours amongst consumers and professions in the front-line of WASH services delivery.

SNV

SNV is a not-for-profit international development organisation that makes a lasting difference in the lives of people living in poverty by helping them raise incomes and access basic services. We focus on the Agriculture, Energy, and Water, Sanitation, and Hygiene (WASH) sectors and have a long-term, local presence in over 25 countries in Asia, Africa and Latin America. Our team of more than 1,300 staff is the backbone of SNV.

Systems change case studies

SNV projects directly benefit millions of people. At the same time, our projects also drive systems change – strengthening institutions and kick-starting markets to help many more people work their way out of poverty, well beyond the scope of projects.

In this series, SNV documents and explores lessons on the way it achieves systems change, with special attention to four key parameters of success:

- leveraging finance,
- kick-starting/shifting markets,
- adoption of improved approaches by government and others,
- shifting values, norms and mindsets.

The growing number of case studies will cover a variety of geographic contexts, (sub-) sectors and development challenges.

Cover photo

Many Tanzanians draw water from shallow wells, which dry up in half a year. Water carried back home are often in small amounts and potentially contaminated (I4ID/ Neema J. Ngelime)

For more information

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