SMALL
Water supply and sanitation in small towns

UNESCO IHE DELFT
Partnership Programme for Water and Development

MAY 2021 – POLICY BRIEF

WATER SERVICES MANAGEMENT IN SMALL TOWNS

LESSONS LEARNED FROM UGANDA AND MOZAMBIQUE

HIGHLIGHTS

1. Small towns or rural growth centers are consistently reporting lower rates of access than urban areas, compromising the realization of United Nations Sustainable Development Goal (SDG6).
2. The inherent heterogeneity of rural and urban zones within the boundaries of small towns is creating an administrative vacuum and posing challenges to the financial viability of water service providers.
3. Emphasis on the financial sustainability of water service providers and the limited budget allocation to local governments is leading to a dual standard of access within the same town.
4. Households in rural (low density) areas of small towns are – due to their sources of income generation being subject to seasonality - less likely to pay regularly for water services, presenting a significant barrier for extending access and achieving full cost recovery.
5. Water infrastructure in small towns includes hand pumps, protected springs and piped networks, with the majority of the population also relying on unprotected sources such as springs, rainwater harvesting, dug wells and ponds.
6. The governance of, and management responsibility for, water sources other than piped networks is often unclear, which leads to a deterioration of the installations and the quality of water sourced from them.

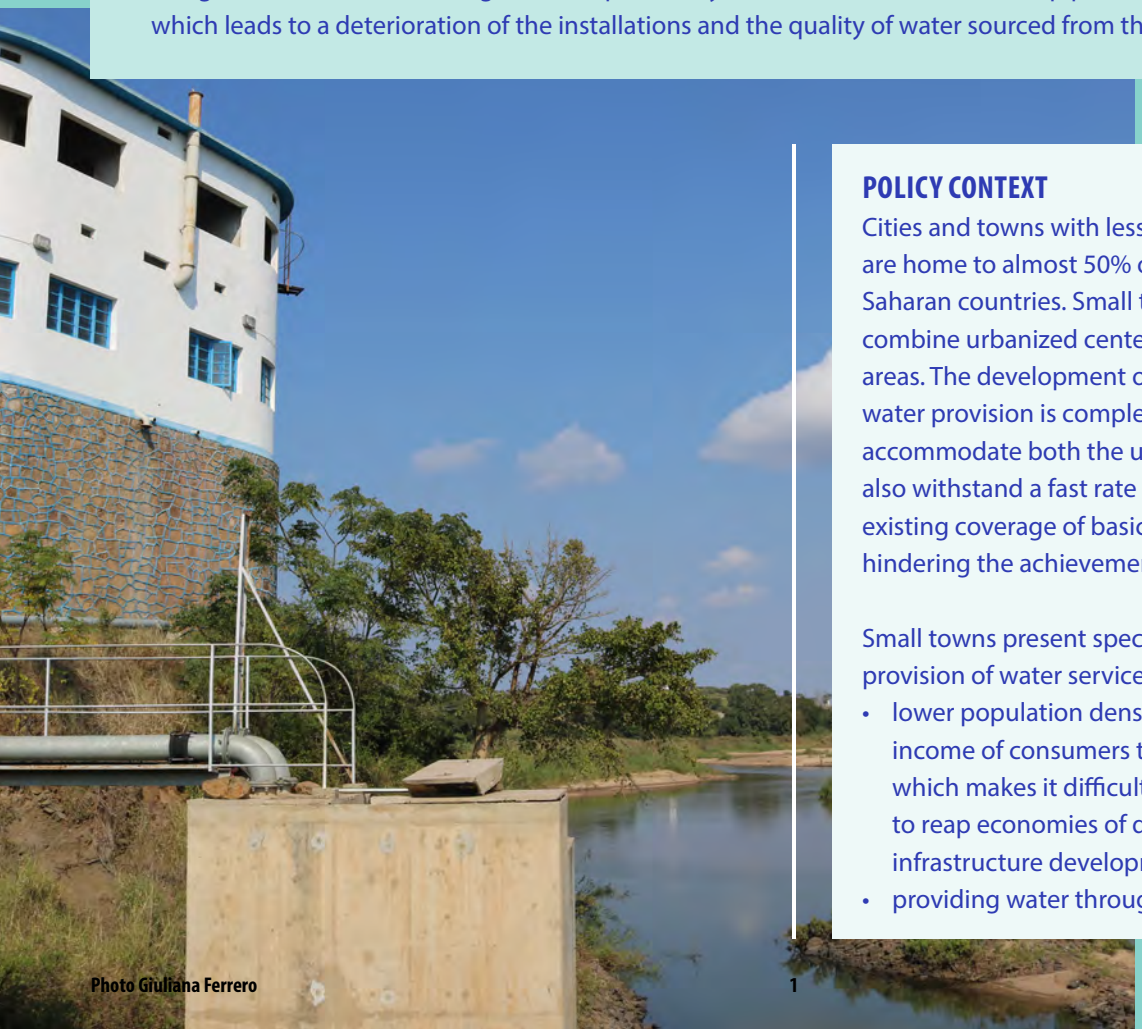

Photo Giuliana Ferrero

POLICY CONTEXT

Cities and towns with less than 300,000 inhabitants are home to almost 50% of the population in sub-Saharan countries. Small towns and cities typically combine urbanized centers with rural surrounding areas. The development of public services such as water provision is complex as it should not only accommodate both the urban and rural realities, but also withstand a fast rate of change. As a result, the existing coverage of basic services is lagging behind, hindering the achievement of SDG number 6.

Small towns present specific dilemmas in terms of the provision of water services [1]:

- lower population density and lower disposable income of consumers than in large urban areas, which makes it difficult for water service providers to reap economies of density and scale in infrastructure development;
- providing water through piped networks to a small

but heterogeneous consumer base that is also scattered over a relatively large area makes these systems relatively expensive to operate (high cost of investment and maintenance vs low revenue potential);
- limited technical capacity for operating and maintaining the water infrastructure that is locally available within the town; and
- the dynamics and diversity of customer segments due to the rapid population growth and other demographic changes requires the implementation of more flexible structures (i.e., a system that can easily and cost-effectively incorporate upgrades and/or withstand future higher consumption levels) rather than established designs of treatment plants and distribution networks.

As a result, water services in small towns are increasingly becoming more complex. The project SMALL set out to identify the operational and financial challenges impacting the provision of inclusive water services in these contexts. We investigated two modalities of water provision implemented in small towns: a national publicly-owned water service provider in Uganda and the delegation of water services to private operators as water service providers in Mozambique.

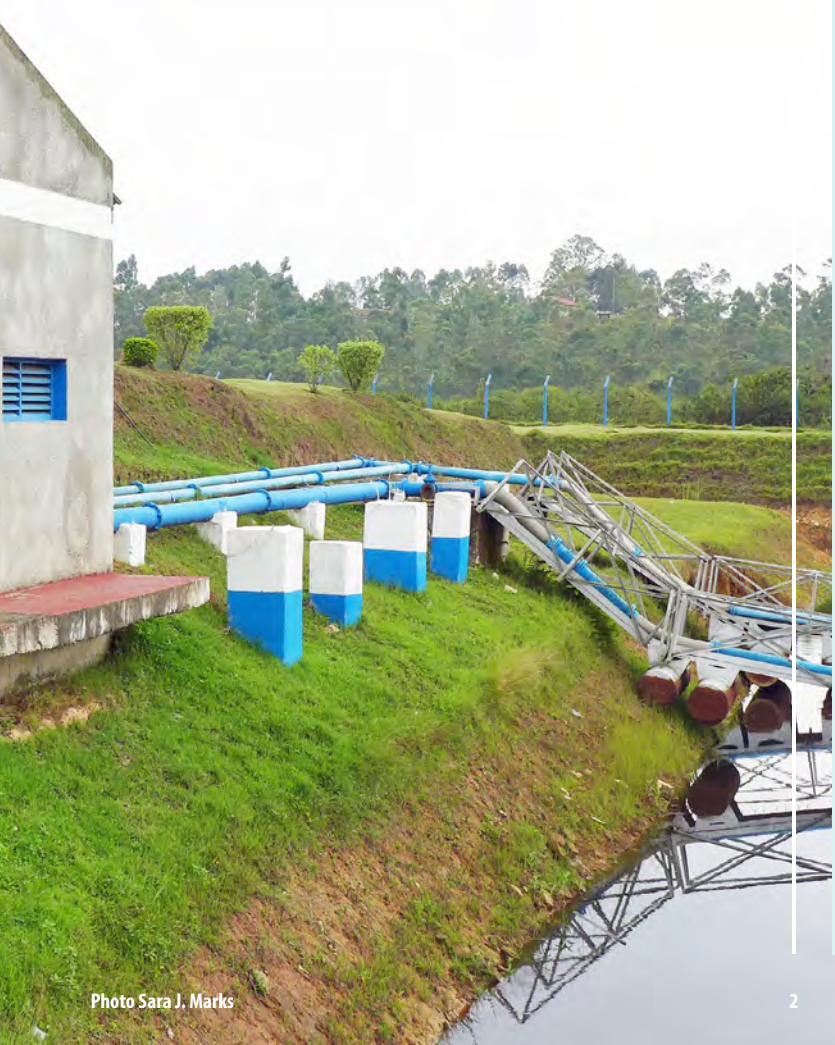

Photo Sara J. Marks

KEY FINDING 1

Definitions of small towns vary and this leads to ambiguity between the administrative boundaries and the service area of water utilities, potentially creating a vacuum of responsibilities.

There is no universally agreed definition of small town, rural growth center or secondary city, limiting comparative studies between countries and preventing the development of standardized metrics. National and local definitions play an important role, as the labels of "urban" and "rural" provide a particular understanding of how the settlement is placed in the administrative government system, and in turn, determines the allocation of budgets, the degree of autonomy, and the type of water infrastructure and management arrangements to be implemented.

While the definition of small towns and associated models appears to create clear boundaries, in practice the boundaries of responsibility are not clear-cut. Small towns, as a result of their rapid growth and often accompanied with a transition from an agriculture to a service-based economy, usually shift over time in the administrative hierarchy of governance. However, the changes in administrative categories and the associated expectation for service delivery (for example, transition to centralized water systems operated by formal providers) do not instantly replace preexisting water use practices of using, sharing and protecting water sources. Often this results in an overlap of ways of governing water in such places. Delegating responsibilities to (public or private) water utilities creates a further divide between the growing urban areas and the adjacent rural areas within the same administrative boundary. After all, an area can be declared urban relatively easily by converting its status on paper to a municipality, but water infrastructure is not changed overnight, nor are the socioeconomic conditions of households needed to access – upon payment – to networked water. The ambiguous relations between these administrative definitions and the allocation of water service areas to formal water providers creates room for maneuver for the various parties involved to interpret and rearrange the boundaries where their responsibility starts and where it ends. This leads to a differentiated level of services within the same town [2]. In parallel, it allows policy makers, water service providers and local governments to conceal themselves behind formal definitions of responsibilities rather than engaging in a collective effort to realize universal water access [3].

KEY FINDING 2

The coexistence of access through centralized water supply and other water sources leads to risks for the consumers.

Water service providers appointed to develop, maintain and operate waterworks in small towns focus on the development of centralized systems for the provision of services to the more densely populated (and usually relatively wealthier) parts of these towns. In this process of infrastructural monopoly, other sources that are common in more rural areas such as (un)protected springs, hand pumps, dug wells or water vendors are labelled as "alternative" sources, even if these sources are still the main water source for the majority of the residents. The quality of the water coming from infrastructures other than the piped network falls outside of the purview of the appointed water service provider and in turn often out of sight of the regulator. This is particular worrisome as the collective ways of maintaining and operating these infrastructures are challenged as social ties are often more difficult to sustain in an urbanizing context, yet the risks of pollution increases due to increasing population density. Neglecting the operation and maintenance of these water infrastructures, in particular the protected springs, exposes water users to increasing risk of water pollution. This is especially the case for poorer households who often cannot afford water from the centralized system, including the supposedly pro-poor public standpipes, and it also affects the more remote neighborhoods where centralized infrastructure is not yet constructed [4].

KEY FINDING 3

Strict interpretations of cost recovery policies may incentivize management decisions leading to access inequalities and stress on systems.

It has become increasingly accepted that water utilities should operate under principles of financial cost recovery based on the collection of user fees. Theoretically, this should release pressure from government budgets, as well as incentivizing water service providers to be more effective and efficient and consumers to use water wisely. In practice, the implementation of these requirements, especially in the context of small towns, has required water service providers to make choices on how the financial sustainability of their operations is preserved. Unfortunately, the incentives to generate sufficient and regular revenue from the provision of water regularly forces water service providers to prioritize connecting only those households and/or neighborhoods that are most likely able to pay for the connection, and more importantly, continue paying for water on a monthly basis [5]. Those not connected to the water supply network because they are economically excluded, may turn to tampering with water infrastructure to gain access. This is generally documented in terms of illegal connections. In project SMALL we also documented how the flows in the network are affected by people who are endorsed by the water service provider tinkering with the infrastructure, further obscuring the roles and responsibilities especially when leakages in these parts of the system emerge [2,6]. The various changes to the infrastructure have an impact on the general hydraulics of the system, causing parts of the network to operate intermittently or shut down completely [4], which then negatively impacts water quality [2, 7].

Photo Giuliana Ferrero

KEY FINDING

4 Source switching may negatively impact the financial performance of the centralized system.

In our research we documented "source switching", which we define as users opting to use different sources for different uses, or to use different sources throughout the year according to water availability (seasonal source switching). In both cases, switching can be motivated by the price of water, for example when rainwater and seasonal springs become available in the rainy months, presenting a lower- or no-cost alternative to the (municipal) water supply [4]. Source switching causes revenue generation to fluctuate over time (sometimes unpredictably), which then impacts the overall financial stability of the utility and limits its ability to respond to major repairs or to plan for system expansions in advance. In addition to source switching, the rapid growth and transient populations (inbound/outbound) of small towns challenge the accurate forecast of water demand. This has been previously documented as a reason for underutilized production capacity, since inaccurate demand estimates are often the basis for overdesign of water distribution systems. Water service providers then have the financial burden to cover the full operational costs of these overdesigned systems, presenting a serious financial burden when the revenues generated by lower than expected demand are insufficient. The inherent path dependence of traditional nonmodular engineering solutions for water treatment and distribution is poorly suited to settlements where demand may fluctuate significantly throughout the year, resulting in serious financial risks to the water service providers in charge of operation, maintenance and upgrades [1].

Photo Giuliana Ferrero

POLICY RECOMMENDATIONS

1. It is not realistic to assume that that piped water service providers are in a position and have the incentives to provide water (in quantity and quality) to the entire population within a small town. Instead, it may be of more value to continue increasing the general awareness among the community regarding the water quality of the different sources in each location and the risks associated with using unsafe sources, especially for drinking or cooking purposes. Other uses, such as farming or livestock rearing, may allow for the use of lesser qualities of water.
2. To encourage water service providers to expand the network and reinvest in the system, formalized relationships should aim for contracts of eight or more years. It is also recommended, especially in these systems in transition, to focus on performance measurements of processes leading to medium- to long-term outputs (increased access to safe and affordable drinking water) rather than on input-based monitoring (e.g., amount of personnel). Such process-oriented measures, however, should not ignore the value of encouraging effective management and operations.
3. For the areas unserved by the piped network, and for the benefit of those yet to be connected, policies should be developed to tackle the issue of low water quality of "rural" water sources and associated infrastructures. For these sources, roles and responsibilities as well as accompanying budget allocations for O&M activities, should be clearly identified. This can be done through an evaluation of the dependency on these sources to fulfil essential drinking and cooking purposes, or other purposes. This will help determine the best-suited organization and the amount of funds required to oversee the water quality of various source types.
4. Water supply provision in small towns should develop effective subsidy-targeting strategies for the urban-rural divide. Without such subsidies, it is unlikely that most small-town water systems will be able to provide universal coverage while also operating on a cost recovery basis, due to the limited ability of many households to pay (especially those outside of the more urban core).
5. We recommend that the use of modular systems that allow for gradual system expansion to match population growth is considered – when applicable. These can include the use of decentralized structures, as well as designing systems with a shorter demand horizon (e.g., 5-10 years). These designs should be accompanied by financial propositions that can account for both demographic and revenue fluctuations over time.

THIS BRIEF IS BASED ON THE FOLLOWING SCIENTIFIC PUBLICATIONS:

[1] Tutusaus, M. (2020). Compliance or Defiance? Assessing the implementation of policy prescriptions for commercialization by water operators. PhD thesis. https://dare.uva.nl/search?identifier=43cdf386-3bcf-4ed4-b84c-4463f26f2de6

[2] Silva-Novoa Sanchez, L.M., Kemerink-Seyoum, J.S., Waisa Batega, D., Paul, R. (2020). Caught in the middle? Access to water in the rural to urban transformation of Bushenyi-Ishaka municipality, Uganda. Water Policy 22(4). https://doi.org/10.2166/wp.2020.024

[3] Tutusaus, M. and Schwartz, K. (2020). Commercialisation as organised hypocrisy: The divergence of talk and action in water services in small towns in Uganda. Water Alternatives 13(2): 248-265. https://www.water-alternatives.org/index.php/alldoc/articles/vol13/v13issue2/573-a13-2-3/file

[4] Marks, S.J., Clair-Caliot, G., Taing, L., Tayebwa Bamwenda, J., Kanyesigye, C., Namanya, E.R., Kemerink-Seyoum, J., Kansiime, F., Batega, D.W., Ferrero, G. (2020). Water supply and sanitation services in small towns in rural-urban transition zones: The case of Bushenyi-Ishaka Municipality, Uganda. Npj Clean Water, 3 (21). https://doi.org/10.1038/s41545-020-0068-4

[5] Tutusaus, M., Cardoso, P., Vonk, J. (2018). (De)constructing the conditions for private sector involvement in small towns' water supply systems in Mozambique: policy implications. Water Policy 20 (S1): 36–51. https://doi.org/10.2166/wp.2018.003

[6] Silva-Novoa Sanchez, L.M.; Kemerink-Seyoum, J.S.; Zwarteveen, M. (2019) Water Infrastructure Always In-The-Making: Distributing Water and Authority through the Water Supply Network in Moamba, Mozambique. Water 2019, 11, (1926). https://doi.org/10.3390/w11091926

[7] Van den Berg, H., Quaye, M.N., Nguluve, E., Schijven, J., Ferrero, G. Effect of operational strategies on microbial water quality in small scale intermittent water supply systems. The case of Moamba, Mozambique. International Journal of Hygiene and Environmental Health. *Under review.*

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