Briefing note: March 2023

Improving management of intermittent piped water systems in Ethiopian small towns

Introduction

Ethiopia has achieved 75% access to piped water in urban areas, up from 33% in 2000 (JMP, 2021). However, most water supply systems are intermittent, providing water for only a few hours per week in some settings.

Intermittency has multiple causes related to the water production capacity, leakages or weaknesses in the piped distribution network, insufficient power supply and financial and governance limitations.

Based on long-term research engagement in Wukro, Tigray, a REACH Water Security Observatory, we present three recommendations for inclusive water services in intermittent piped water systems in small towns in Ethiopia. At the national level, there needs to be more attention to the intermittency of urban water supply systems in policy and management and what this means for climate resilient urban WASH planning.

Recommendations

1. For inclusive, intermittent water supply systems, there should be a full cost-recovery model allowing for targeted investments.
2. Household entrepreneurs, especially women, should be used as indicator of water needs for more inclusive water access in small towns in Ethiopia.
3. Free or subsidised water storage containers for the poorest households (shared or individual) will help to offset inequities in intermittent water availability.

Background

In 2015, Ethiopia achieved the Millennium Development Goal to halve the number of people without access to an improved water source.[1] There has been a growing focus on delivering piped water onto premises to meet target SDG 6.1 for universal access to safely managed drinking water from an improved water source that is free from contamination, available when needed and accessible on premises.

Additionally, one of the guiding principles of the Ethiopian National Water Policy and Strategy is that, "The state takes steps to progressively realise every citizen's access to sufficient, continuously available, affordable and safe drinking water and sanitation, with the aim to achieve universal and equitable access and leave no one behind."

In intermittent piped water systems, people may need to access water from alternative sources and there may be health risks from contaminated water. People living in small towns experience water insecurity in uneven ways due to intermittency and social inequalities.

Urban water insecurity in small towns in Ethiopia is considered as the even distribution of the risks and benefits of intermittent urban water supplies (Grasham et al., 2022).

1 Includes: piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water.

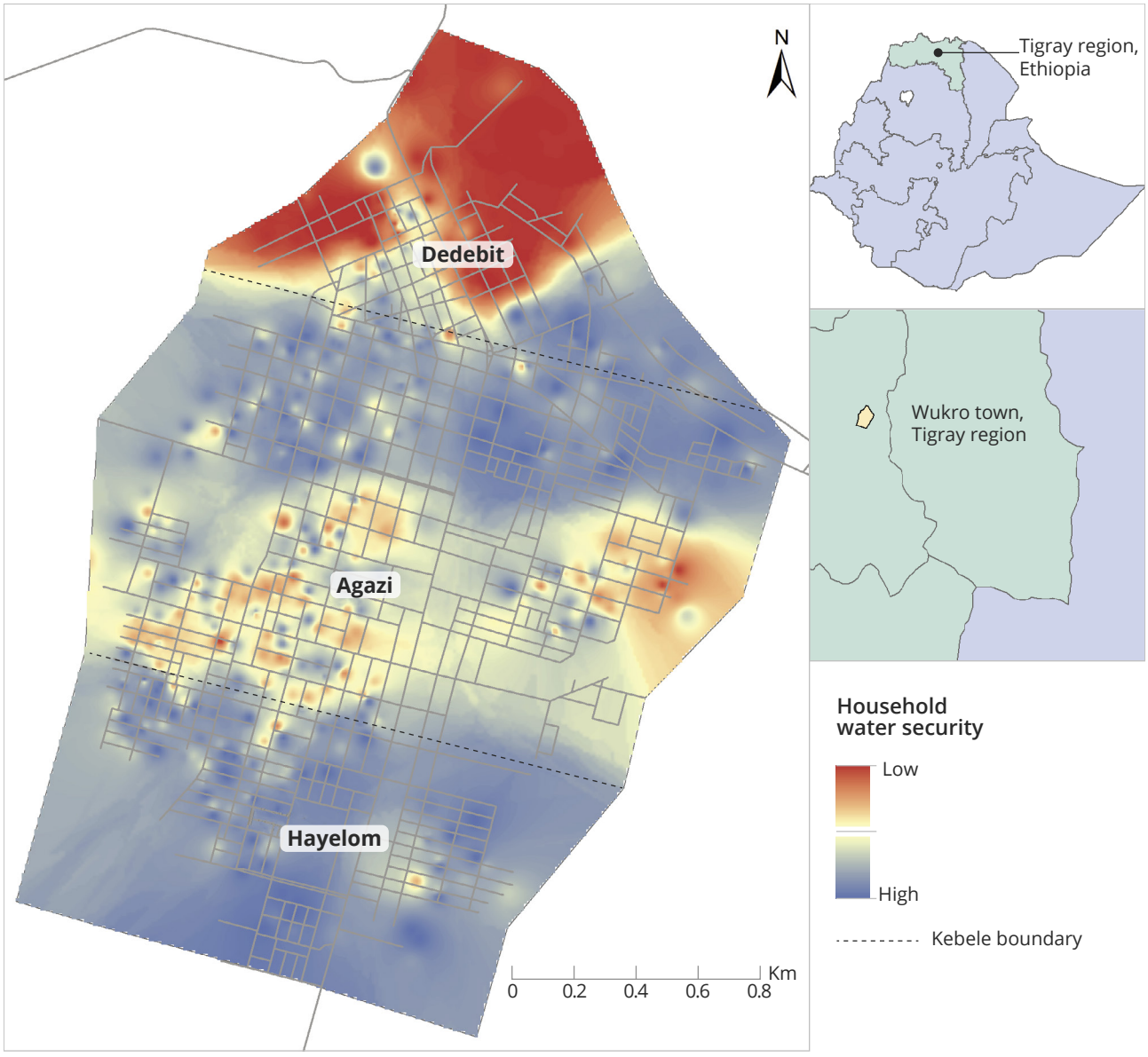
Methods

Wukro town, population approximately 50,000, was selected for a detailed study of water access. The town had almost universal access of piped connections on premises (97% of households). Pressure on water resources had been increasing from the growing population and town development.

To improve urban water access in the town, Wukro water utility, with support from the National ONEWASH programme, UNICEF and UK Foreign, Commonwealth & Development Office, as well as the Tigray regional and national governments, expanded and renovated the existing piped water system. Inaugurated in 2018, this included the development of more productive and reliable boreholes.

The findings in this policy brief are from multiple studies that took place during the transition period of the new system between 2017 and 2019 while water supply was intermittent.

Figure 1: Map of Wukro town showing worse water access in the Northernmost urban Kebele, Dedebit, and better access in the other areas.



This included: 1) a household survey of 701 households; 2) a daily water diary filled every day for 10 months by 120 households; 3) 50 in-depth interviews with entrepreneurs (mainly, women local alcohol shop brewers); 4) monthly billing records of 6,993 domestic customers between and 5) University of Mekelle, Health and Demographic Surveillance Systems (HDSS) data from all households.

Summary of research findings

Despite near universal access to piped water, household water security – reliability, sufficiency, quality and affordability of water – varied across the town. This was because of social inequalities, system management challenges and uneven access to water storage.

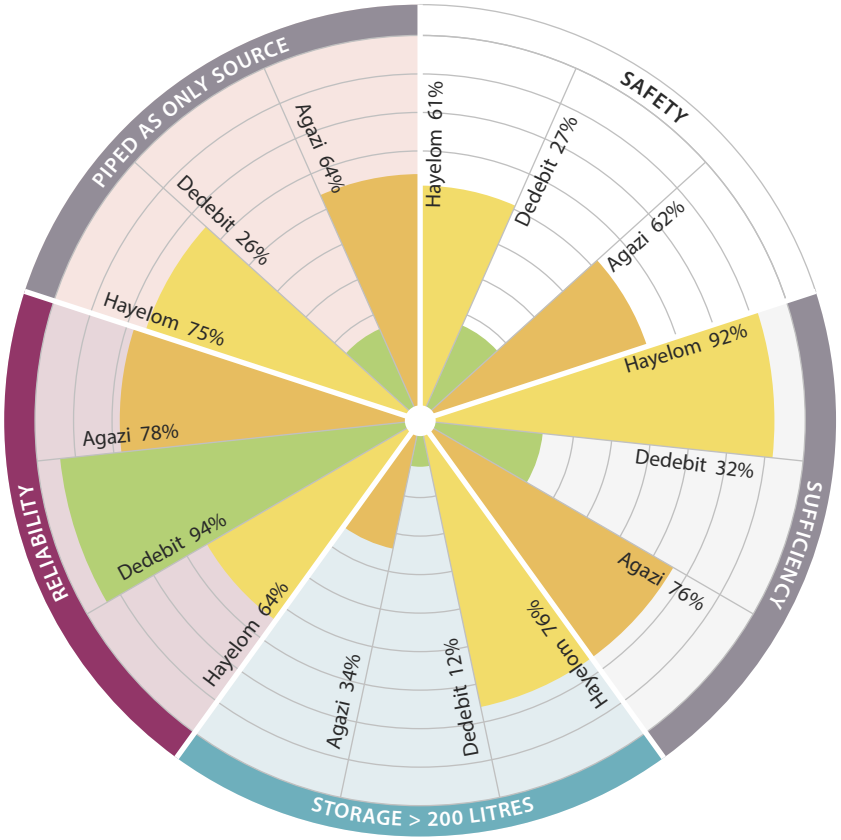
Wukro is comprised of three urban kebeles with the Northernmost one, Dedebit, shown to be the more water insecure than the other two (see Figure 1).

Based on our analysis, Dedebit kebele had worse access to water because water was reported as: unsafe, insufficient, and residents had to use water from alternative sources most frequently (Figure 2). There was also a larger proportion of tenants and female entrepreneurs living in Dedebit kebele.

Water storage is key to improving availability of water for all in intermittent systems

Households with their own water storage tanks had better water access than those without. Lack of access to storage was one of the key reasons for differences in access to water when needed, and reliance on other supplies. Average water storage volumes by household ranged from 28 litres in Dedebit kebele to 150 litres in the most water secure kebele. Households with greater than 200 litres storage capacity were able to cope more with unreliable supplies.

Figure 2: Indicators of water access in the three urban kebeles in Wukro, showing that Dedebit had a reliable piped supply but is weak in all other indicators.



Indicator	Definition
Piped as only source	Households had not needed to use any alternative water sources in the last 2 weeks.
Safety	Household perceived drinking water to be safe
Sufficiency	Household had not stopped any water-using activities in the household in the last two weeks
Storage > 200 l	Household reported having at least 200 l storage capacity for water in the home
Reliability	Household had used water from their tap every day in the past 2 weeks.

Socio-economic inequalities mediate water access

There are water-related inequities across social groups, with household entrepreneurs and residential tenants being at a particular disadvantage. Female household entrepreneurs in Wukro have unique water challenges (Korzenevica et al., 2022). Unreliable and intermittent water access in Wukro impacts household enterprises through constraining the operation of water-intensive businesses such as making coffee and brewing beer (Zerihun et al., 2020).

Using household entrepreneurs, especially women, as an indicator of water need can help to identify if the water system is servicing the most vulnerable populations and quickly identify inequalities in service provision.

Constraints on the urban economy

Tap water is affordable: Households pay 6.5 Birr/m^3 for water from the tap and 120 Birr/m^3 for water from alternative sources; both were reported as affordable. However, the water tariff was not enabling a full cost-recovery model.

Female entrepreneurs engaged in water intensive businesses, such as beer-brewing or coffee-selling, struggle to access enough water to run their businesses meaning that their businesses become intermittent, directly constraining the economy.

Key references

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