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**EQUITABLE AND SUSTAINABLE WASH SERVICES:
FUTURE CHALLENGES IN A RAPIDLY CHANGING WORLD**

Equitable urban water security: Beyond household connections

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Brief overview

Sustainable Development Goal (SDG) 6 – safe and affordable water and sanitation for all – cannot be met without the explicit consideration of equity. Across sub-Saharan Africa, small and medium urban centres are growing with implications for equitable urban water security. Piped household connections are widely considered as the gold standard for urban water provision – mitigating water safety risks from transporting water as well as the time burden of collecting water that most often falls to women. In Wukro, Ethiopia, 97% of households have access to a tap in their dwelling – an unusually high level of urban water infrastructure for a small town in sub-Saharan Africa. Despite this, water security in the town remains inequitable. Our study offers solution-based insights into furthering equity in piped urban water systems that are highly relevant for water managers working in urban WASH.

Case study site and methods

Wukro, a town in Ethiopia with a population of around 50,000, has a legacy of water insecurity and vulnerability to endemic drought. To improve urban water access in the town, Wukro water utility, with support from UNICEF as well as the regional and national government, installed a new water supply system that was inaugurated in 2018. The findings in this paper are based on longitudinal engagement in Wukro with multiple stakeholders since 2015, with the FCDO-funded REACH water security global research programme. Therefore, we observe changes in water security over time.

Mixed methods were used in this study: 1) HDSS demographic and WASH survey data, 2016; 2) A WASH household survey (n=701), 2019; 3) Water diaries: 100 households filled daily water diaries for 10 months (2018-2019); 4) and qualitative studies (>50 female entrepreneurs interviewed, 2018-2020).

Analysis and findings

The findings are based on answering the following research questions: 1) In an urban water system with 97% piped household connections, what is the status of equity in urban water security? And 2) What are the explanations for existing inequities? Statistical (SPSS), spatial mapping (ArcMAP) and qualitative (NVIVO) analyses have been conducted.

Overview of 2019 WASH survey with summary statistics

The 2019 WASH household survey of 701 households in Wukro revealed that 97% of households have a piped water connection into their dwelling and 74% of households were buying water from another house in Wukro to meet their household water needs. Female respondents totalled 80% and we found that water management is gendered, with women predominantly responsible for household water access and payments for water.

What is the status of equity in urban water security?

Wukro residents reported a reduction in concern about water in 2019 compared to 2016, and in August 2019, 60% of households were satisfied that their household water needs had been met in the last month. Despite these improvements, inequities in urban water security remain.

To examine equity in urban water security, a household water security index has been developed using fuzzy set analysis (FSA) with 8 indicator variables from the 2019 WASH dataset. With this, we separated households into five water security groups and have undertaken spatial and statistical analyses to examine water inequities. The index has been validated with the data from the water diaries, and with subjective indicators of reporting of perceived household water security compared to other urban residents.

What are the explanations for inequities?

Preliminary findings reveal three key explanations for inequities in urban water security:

1. **Infrastructure:** spatial inequities exist across the town due to the intermittent functionality of the piped water infrastructure, meaning that households in certain areas are less water secure.
2. **Household wealth:** In Wukro, 78% of residents are homeowners (42% landlords with 1 or 2 tenants) while 18% are renters. Landlords are the most water secure while renters are the least water secure.
3. **Gender:** Household enterprises are undertaken by 23% of households and 80% of them are led by women. A large majority of household entrepreneurs are in the lowest water security group.

Implications for urban water management

The overarching conclusion from this research is that we need to think beyond household connections for equity in piped urban water systems, especially for SDG 6, since it requires reaching marginalised groups.

Household connections are not a panacea since infrastructure, household wealth and gender play significant roles in mediating equitable urban water security. This has two key implications that can be used to strengthen urban water development planning in the Global South while reducing inequities:

1. **The functionality of urban infrastructure is unequal and must be addressed in planning for equity in urban water systems.**
2. **Socio-economic inequities, such as household wealth and gender, must be examined, included, and evaluated throughout the implementation of urban water supply developments.**

Broader conclusions

In our comprehensive study, we move towards filling two gaps in the peer-reviewed literature:

1. Evidence about gendered urban water security in small and medium urban centres (Grasham, *et al.*, 2019).
2. How do we measure urban water security experiences? We answer this with evidence from a unique infrastructure context that offers multi-faceted explanations for inequities in urban water security.

We reveal that historical experiences of water insecurity influence people's perceptions of current water security. In Wukro, these have been drought experiences that caused water-driven migration to the town that resulted in very low water use during periods of drought in the past. This has influenced how residents responded to survey questions about satisfaction and reliability of the urban water supply.

This study has relevance for the emerging paradigm of climate resilient WASH: water security in the Wukro varies seasonally, revealing that climate resilient WASH is not just about climate shocks, but also about managing expected intra-annual variability.

References

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