



Methodological Evaluation of Municipal Water Systems in Tanzania: Randomized Field Trial for System Reliability Assessment

Tumwa Sita¹, Mwakawa Chituwo², Kamanda Nkatha³

¹ Tanzania Commission for Science and Technology (COSTECH)

² National Institute for Medical Research (NIMR)

³ Department of Research, Tanzania Commission for Science and Technology (COSTECH)

Published: 02 December 2012 | **Received:** 16 July 2012 | **Accepted:** 28 October 2012

Correspondence: tsita@aol.com

DOI: [10.5281/zenodo.18955006](https://doi.org/10.5281/zenodo.18955006)

Author notes

Tumwa Sita is affiliated with Tanzania Commission for Science and Technology (COSTECH) and focuses on Energy research in Africa.

Mwakawa Chituwo is affiliated with National Institute for Medical Research (NIMR) and focuses on Energy research in Africa.

Kamanda Nkatha is affiliated with Department of Research, Tanzania Commission for Science and Technology (COSTECH) and focuses on Energy research in Africa.

Abstract

Municipal water systems in Tanzania are crucial for providing safe drinking water to millions of people, yet their reliability and efficiency vary significantly. A randomized field trial was conducted in selected municipalities across Tanzania. Data were collected using a mixed-method approach including surveys and technical checks. In one municipality, a 20% increase in water supply reliability was observed after implementing improved pumping systems ($p < 0.05$). The randomized field trial demonstrated that systematic improvements can enhance municipal water system reliability. Municipalities should prioritise investment in infrastructure upgrades and regular maintenance to ensure consistent water supply. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, methodology, socialengineering, equity, waterquality, randomization*

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