



Methodological Evaluation of Municipal Water Systems in Tanzania: Quasi-Experimental Design for Efficiency Gains,

Simeon Namaguru¹, Simiyu Simbuni², Mwakisanga Magogo², Kamali Mbugua^{2,3}

¹ Department of Advanced Studies, State University of Zanzibar (SUZA)

² Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

³ Department of Interdisciplinary Studies, Mkwawa University College of Education

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Correspondence: snamaguru@aol.com

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Author notes

Simeon Namaguru is affiliated with Department of Advanced Studies, State University of Zanzibar (SUZA) and focuses on Environmental Science research in Africa.

Simiyu Simbuni is affiliated with Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Environmental Science research in Africa.

Mwakisanga Magogo is affiliated with Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Environmental Science research in Africa.

Kamali Mbugua is affiliated with Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Environmental Science research in Africa.

Abstract

The efficacy of municipal water systems in Tanzania is a subject of increasing interest due to growing urban populations and climate change impacts. A longitudinal study employing mixed-methods research including surveys, interviews, and statistical modelling to evaluate system performance over a five-year period. Users reported an increase of 20% in water supply reliability post-intervention compared to baseline data, with no significant adverse effects observed on service quality. The quasi-experimental design demonstrated effectiveness in measuring efficiency gains within municipal water systems, contributing to evidence-based policy recommendations for other regions facing similar challenges. Adoption of robust monitoring and evaluation frameworks should be encouraged alongside infrastructure upgrades to ensure sustainable municipal services. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Tanzania, Geographic Information Systems, Quasi-Experimental Design, Water Resource Management, Stakeholder Analysis, Quantitative Research Methods, Qualitative Inquiry Techniques

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