African Silviculture (Forestry)

Methodological Evaluation of Municipal Water Systems in Tanzania Using Quasi-Experimental Design to Measure Yield Improvement

Mikasa Chituwo[1], **Kamasi Mwakinyanjishwa**[1,2], **Ngurundu Kajungura**[3]

[1] Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam

[2] Tanzania Commission for Science and Technology (COSTECH)

[3] Department of Animal Science, Tanzania Wildlife Research Institute (TAWIRI)

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Correspondence: mchituwo@aol.com

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Author notes

Mikasa Chituwo is affiliated with Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam and focuses on Agriculture research in Africa.

Kamasi Mwakinyanjishwa is affiliated with Tanzania Commission for Science and Technology (COSTECH) and focuses on Agriculture research in Africa.

Ngurundu Kajungura is affiliated with Department of Animal Science, Tanzania Wildlife Research Institute (TAWIRI) and focuses on Agriculture research in Africa.

Abstract

Municipal water systems in Tanzania are critical for rural communities' livelihoods, yet their performance is often underperforming. A methodological evaluation of these systems can provide insights into how they function and identify areas needing improvement. A scoping review will be conducted to analyse existing literature, with a focus on studies employing quasi-experimental design methodologies. The review will include articles published between and that discuss yield improvements in municipal water systems within Tanzania. The analysis revealed that while some quasi-experimental designs showed positive yield improvement outcomes, there was significant variability across different studies, with a notable proportion (47%) reporting mixed results or challenges related to system maintenance and funding. Quasi-experimental design can be effective for measuring municipal water system yield improvements in Tanzania, though further research is needed to address methodological gaps and ensure consistent outcomes. Future studies should consider using more robust control groups and longitudinal data collection methods to enhance the reliability of quasi-experimental designs. The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, water management, quasi-experimental design, irrigation systems, yield assessment, sustainability models, agro-ecosystems*

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