



Methodological Evaluation of Municipal Water Systems in Uganda: Randomized Field Trial for Efficiency Gains

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Abstract

Municipal water systems in Uganda face challenges related to efficiency and cost-effectiveness. A mixed-method approach combining quantitative data analysis with qualitative observations was employed to assess system performance and identify potential enhancements. In the randomized field trial, an average of 15% reduction in water loss was observed among treated systems compared to control groups, indicating improved efficiency. The findings suggest that targeted interventions can significantly enhance municipal water system efficiency in Uganda. Implementing a comprehensive monitoring and maintenance programme is recommended for future improvements in the sector. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Uganda, Geospatial Analysis, Stakeholder Engagement, Water Resource Management, Randomized Controlled Trials, Performance Metrics, Sustainability Assessment*

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