



Reliability Assessment of Municipal Water Systems in Uganda: A Longitudinal Field Trial

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Abstract

Uganda faces significant challenges in maintaining reliable municipal water systems, impacting both public health and economic development. A mixed-method approach combining quantitative data analysis with qualitative interviews to assess system functionality, user satisfaction, and infrastructure durability. During the first year of operation, 75% of municipal water systems showed consistent supply without disruptions. User feedback indicated a need for improved hygiene education campaigns. The study confirms the reliability assessment methodology's effectiveness in monitoring Ugandan municipal water systems' performance over time. Implementing user-focused training programmes and regular maintenance schedules will enhance system reliability and community satisfaction. Uganda, Municipal Water Systems, Reliability Assessment, Longitudinal Study The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, longitudinal study, water management, reliability assessment, irrigation systems, econometrics, stochastic models*

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