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Panel Data Estimation for Measuring System Reliability in Municipal Infrastructure Assets Systems in Kenya: An Evaluation

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Abstract

This study focuses on evaluating municipal infrastructure assets systems in Kenya with a specific emphasis on measuring system reliability. Panel data analysis was employed to evaluate municipal infrastructure assets in Kenya. A generalized linear mixed model (GLMM) with robust standard errors was used to estimate system reliability, accounting for time-invariant and time-varying effects. The GLMM revealed a significant positive correlation ($\beta = 0.53$, $p < 0.01$) between the level of maintenance funding and system reliability across different municipalities in Kenya. This study underscores the importance of consistent funding for municipal infrastructure to enhance system reliability, providing evidence-based insights for policy makers. Policy recommendations include prioritising investment in maintenance budgets to improve municipal infrastructure systems' performance.

Keywords: *Kenyan, Municipal, Infrastructure, Panel, Econometric, Time-Series, Regression*