



Methodological Assessment of Municipal Infrastructure Asset Systems in Uganda: A Randomized Field Trial on System Reliability

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Abstract

Ugandan municipalities face significant challenges in maintaining their infrastructure assets due to limited funding and technical expertise. A randomized field trial was conducted across selected municipalities. Infrastructure data were collected using standardised surveys and statistical models for reliability assessment. The analysis revealed that 75% of the sampled assets exhibited high-reliability characteristics, with no significant differences observed between urban and rural settings. This study underscores the need for systematic monitoring and targeted investment in municipal infrastructure to enhance system reliability. Ugandan municipalities should prioritise regular asset inspections and adopt reliable maintenance practices to ensure sustainable infrastructure performance. Infrastructure Reliability, Municipal Systems, Randomized Field Trial, Uganda The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geographic, Infrastructure, Methodology, Reliability, Asset Management, Randomization, Field Study*

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