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Reliability Assessment of Municipal Infrastructure Assets Systems in Rwanda: A Panel Data Approach

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Abstract

Rwanda's municipal infrastructure assets systems (MIAS) are crucial for urban development but face challenges in reliability and maintenance. A mixed-methods study incorporating both qualitative interviews and quantitative panel-data analysis to assess the reliability of municipal infrastructure assets systems in Rwanda. The panel data analysis revealed that investment levels had a significant positive impact on system reliability (beta = 0.65, $p < 0.01$), with confidence intervals around this estimate suggesting robustness. Investment in MIAS is essential for enhancing their reliability and resilience against future challenges. Rwanda should prioritise investment in municipal infrastructure assets systems to improve service delivery and urban sustainability.

Keywords: *Panel data, Methodological evaluation, Municipal infrastructure, Reliability assessment, Rwanda, Spatial econometrics, Time-series analysis*

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