Methodological Evaluation of Municipal Infrastructure Assets Systems in Rwanda Using Quasi-Experimental Design

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Abstract

Rwanda's municipal infrastructure assets systems are critical for urban development and service delivery. However, there is a need to evaluate their efficiency and effectiveness systematically. A quasi-experimental design was employed to assess the impact of various interventions on municipal infrastructure assets. Data from three municipalities were collected over two years, with a sample size of 200 assets per municipality. A notable improvement in asset yield was observed in one municipality where targeted maintenance programmes were implemented (direction: increase by 15%), indicating the effectiveness of such interventions. The quasi-experimental design proved effective in measuring yield improvements and provided insights into optimal resource allocation strategies for municipal infrastructure assets in Rwanda. Recommendation is made to replicate the findings in other municipalities, with a focus on implementing targeted maintenance programmes as a proven strategy for enhancing asset performance. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Rwanda, Infrastructure Assessment, Quasi-Experimental Design, Asset Management, Econometrics, Spatial Analysis, Performance Metrics*

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