Methodological Assessment of Municipal Infrastructure Asset Systems in Senegal: A Randomized Field Trial

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Abstract

The study examines municipal infrastructure asset systems in Senegal to assess their operational efficiency. A randomized field trial design was employed, with a sample size of 100 municipal units across Senegal. Data were collected using standardised asset assessment tools. The trial revealed that the use of predictive maintenance models reduced asset failure rates by 25%, indicating significant efficiency gains. Randomized field trials provide a robust method for measuring and enhancing municipal infrastructure performance, offering clear insights into asset management strategies in Senegal. Municipal authorities should implement predictive maintenance models to further improve asset reliability and reduce operational costs. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, African, Spatial, Heterogeneity, Randomization, Impact, Evaluation*

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