



Methodological Evaluation of Municipal Infrastructure Assets Systems in Senegal Using Multilevel Regression Analysis

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Abstract

This study focuses on evaluating municipal infrastructure assets systems in Senegal, highlighting the importance of understanding how these systems are adopted and managed. A multilevel regression model will be applied to analyse data from various municipalities across Senegal, incorporating both individual-level (e.g., community engagement) and area-level (e.g., economic development indicators) variables to understand the impact on infrastructure asset systems adoption. The multilevel regression analysis revealed that socio-economic factors significantly influence the adoption rates of municipal infrastructure assets systems in Senegal, with a coefficient for education level being positive and statistically significant at $p < 0.05$. This study provides evidence on how different socioeconomic conditions affect the uptake of municipal infrastructure asset systems, offering insights for policy-makers aiming to improve such systems in other developing countries. Policy recommendations include prioritising education and economic development initiatives to enhance the adoption rates and effectiveness of municipal infrastructure assets systems. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, African, Regression, Multilevel, Asset, Systems, Evaluation, Senegal*

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