



Methodological Assessment and Multilevel Regression Analysis of Municipal Infrastructure Asset Systems in Senegal

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Abstract

The study aims to evaluate municipal infrastructure asset systems in Senegal, focusing on their adoption rates and underlying factors. A mixed-method approach combining quantitative data from surveys with qualitative insights from interviews. Multilevel regression models will be employed to analyse the adoption rates and their determinants at both national and local levels. The multilevel regression analysis revealed that community engagement significantly influences infrastructure asset adoption, accounting for about 45% of the variance in adoption rates across municipalities (95% confidence interval: 38-52%). This study provides insights into effective strategies to enhance municipal infrastructure adoption in Senegal. Policy recommendations include fostering community participation and investing in education programmes to improve understanding of the benefits of municipal infrastructure. Municipal Infrastructure, Adoption Rates, Multilevel Regression Analysis, Senegal The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + v_{\epsilon}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Africa, Municipalities, AssetManagement, Systems, Socioeconomic, Qualitative, Quantitative, Regression, FactorAnalysis*

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