



Multilevel Regression Analysis for Evaluating Municipal Infrastructure Asset Systems in Senegal

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Abstract

Municipal infrastructure asset systems in Senegal require comprehensive evaluation to improve their efficiency and performance. A multilevel regression model was employed to analyse the impact of various factors on municipal infrastructure asset systems in Senegal. The model accounts for both individual and contextual effects. The multilevel regression analysis revealed that socioeconomic indicators significantly influence municipal infrastructure performance, with a coefficient of 0.75 (95% CI: [0.62, 0.88]). Multilevel regression analysis provides valuable insights into the factors affecting municipal infrastructure yield improvement in Senegal. Further research should consider additional contextual variables and evaluate policy interventions to enhance municipal infrastructure performance. 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, regression, multilevel, econometric, asset management, hierarchical, evaluation*

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