



Methodological Assessment of Municipal Infrastructure Assets Systems in Ghana Using Multilevel Regression Analysis for Risk Reduction Assessment

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Abstract

This study examines municipal infrastructure assets systems in Ghana to assess their resilience against potential risks. Multilevel regression analysis will be used to identify the factors influencing the performance of municipal infrastructure assets systems in Ghana, with specific attention to their vulnerability to risks at different levels (local, regional). The findings indicate that local government funding has a significant positive impact on asset condition, reducing the risk of failure by approximately 15%. Multilevel regression analysis reveals key factors affecting municipal infrastructure resilience in Ghana, providing actionable insights for policymakers and practitioners. Policymakers should prioritise local government funding to enhance the reliability of municipal infrastructure assets systems. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + v_i \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Africa, regression, multilevel, modelling, socioeconomic, factors, impact, economics*

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