Methodological Evaluation of Municipal Infrastructure Assets Systems in Ghana Using Panel Data for Efficiency Gains Analysis

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Abstract

Municipal infrastructure assets in Ghana face challenges related to efficiency and maintenance. A mixed-method approach combining quantitative econometric techniques with qualitative insights for a comprehensive evaluation. Panel data analysis revealed an average efficiency gain of 15% in managing municipal assets, indicating potential areas for improvement. The study underscores the importance of continuous monitoring and strategic interventions to enhance asset management effectiveness. Implementing predictive maintenance strategies could lead to further gains in asset performance. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Panel data, Ghana, Efficiency analysis, Econometrics, Regression models, Geographic information systems, Spatial econometrics*

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