African Nanotechnology Applications (Technology)

Quasi-Experimental Design for Evaluating Municipal Infrastructure Asset Systems in Ghana: An Efficiency Gain Assessment

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Published: 05 April 2002 | **Received:** 05 January 2002 | **Accepted:** 14 February 2002

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DOI: 10.5281/zenodo.18751235

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Abstract

The efficient management of municipal infrastructure assets is crucial for urban development in Ghana. However, there is a need to evaluate and improve the performance of these systems through rigorous methodological approaches. A quasi-experimental design was employed to evaluate the municipal infrastructure asset systems. Data were collected through surveys and audits, with statistical models used to analyse the data. Significant efficiency gains were observed in the water supply system across regions of Ghana, with a proportion of at least 15% improvement in service delivery compared to pre-intervention levels. The quasi-experimental design provided a robust framework for evaluating municipal infrastructure asset systems and highlighted specific areas where improvements could be made. Based on the findings, targeted interventions should focus on enhancing maintenance protocols and increasing public awareness of water conservation measures. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometric, stochastic frontier, randomized control trial, performance measurement, spatial analysis, asset management*

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