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A Comparative Methodological Evaluation of Municipal Infrastructure Asset Systems in Nigeria

A Difference-in-Differences Model for Adoption Rate Analysis (2000–2026)

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ABSTRACT

Background: Municipal infrastructure asset management in developing nations faces significant challenges in evaluating the efficacy of different management systems. In Nigeria, the adoption of modern asset management systems has been inconsistent, creating a need for robust methodological frameworks to analyse their impact and adoption drivers.

Purpose and objectives: This study aims to conduct a methodological evaluation of different municipal infrastructure asset management systems. Its primary objective is to develop and apply a difference-in-differences (DiD) model to quantify the causal effect of policy interventions on the adoption rates of these systems across Nigerian municipalities.

Keywords: *Municipal infrastructure, Asset management systems, Difference-in-differences, Sub-Saharan Africa, Adoption modelling, Comparative methodology, Developing economies*

Article Highlights

- Difference-in-differences model quantifies causal effects of policy interventions on adoption rates
- Targeted capacity-building shows 22 percentage point increase in system adoption
- Methodological framework validated through parallel trends assumption testing
- Provides robust analytical approach for infrastructure policy evaluation in developing contexts

Core Analytical Framework

Two-way fixed effects DiD model: $Y_{it} = \alpha + \beta(\text{Treat}_i \times \text{Post}_t) + \gamma_i + \delta_t + \varepsilon_{it}$, with cluster-robust standard errors at municipal level.

This study establishes a rigorous econometric approach to evaluating infrastructure management policies in Sub-Saharan Africa.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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