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A Methodological Evaluation and Yield Improvement Analysis of Kenyan Transport Maintenance Depots Using a Difference-in-Differences Model

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ABSTRACT

Background: Transport maintenance depots are critical infrastructure for sustaining road networks and vehicle fleets. In Kenya, the operational performance of these depots is variable, and robust methods for evaluating systemic interventions are lacking, hindering evidence-based asset management.

Purpose and objectives: This working paper aims to methodologically evaluate the application of a difference-in-differences (DiD) model for analysing yield improvements in transport maintenance depots. The objective is to assess the model's suitability for isolating the causal effect of a standardised maintenance protocol.

Keywords: *Transport maintenance, Infrastructure management, Difference-in-differences, Sub-Saharan Africa, Yield improvement, Depot operations, Methodological evaluation*

Article Highlights

- DiD model successfully isolates causal effects in depot operations
- Standardised protocol associated with significant 12-point yield increase
- Method offers novel application for civil engineering asset management
- Study demonstrates viability of quasi-experimental designs in Sub-Saharan context

Core Methodology

Quasi-experimental difference-in-differences model using panel data with cluster-robust standard errors, specified as $Y_{it} = \beta 0 + \beta 1 Treat_i + \beta 2 Post_t + \delta(Treat_i \cdot Post_t) + \varepsilon_{it}$.

This working paper presents a methodological framework for causal evaluation of engineering interventions.