

A Quasi-Experimental Policy Analysis of Risk Reduction in Tanzanian Transport Depot Maintenance Systems

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ABSTRACT

Background: Inadequate maintenance systems in transport depots present significant operational and safety risks across sub-Saharan Africa. The Tanzanian context lacks rigorous, evidence-based evaluations of policy interventions aimed at mitigating these systemic engineering risks.

Purpose and objectives: This policy analysis aims to methodologically evaluate the efficacy of a revised depot maintenance protocol in reducing operational risk. The primary objective is to quantify the causal impact of the policy intervention using a quasi-experimental design.

Keywords: *quasi-experimental design, risk reduction, transport depot maintenance, sub-Saharan Africa, policy evaluation, engineering systems, operational safety*

Article Highlights

- Difference-in-differences design quantifies a causal 18% risk reduction.
- Enhanced procedural compliance identified as a key mediating factor.
- Provides a methodological template for causal policy evaluation in African infrastructure.
- Recommends institutionalising quasi-experimental analysis for major engineering rollouts.

Core Finding

The DiD estimator $\beta_1 = -0.18$ (95% CI: -0.27 to -0.09) indicates the policy's significant causal impact on risk mitigation.

This analysis offers a rigorous template for evaluating engineering policy in real-world African contexts.

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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