

CASE STUDY

A Randomised Field Trial for Yield Optimisation in Tanzanian Transport Maintenance Depot Systems

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ABSTRACT

Background: Transport maintenance depots in sub-Saharan Africa face systemic inefficiencies, leading to suboptimal asset availability and high operational costs. There is a recognised lack of rigorous, field-based evidence on the impact of systematic interventions within these complex engineering systems.

Purpose and objectives: This case study aimed to methodologically evaluate a randomised field trial designed to measure and optimise yield—defined as the proportion of vehicles fully operational—within a representative depot network. The primary objective was to quantify the causal effect of a revised maintenance scheduling protocol on overall fleet yield.

Keywords: *Randomised controlled trial, Yield optimisation, Maintenance depot systems, Sub-Saharan Africa, Asset availability, Operational efficiency, Field experiment*

Article Highlights

- Randomised trial across 24 depots shows causal impact of predictive scheduling.
- Intervention yielded a significant 8.7 percentage point increase in fleet availability.
- Methodology proves feasible for generating high-quality evidence in complex engineering systems.
- Findings support scalable, data-driven interventions for asset management in sub-Saharan Africa.

Trial Design

A pragmatic RCT assigned depots to a new predictive maintenance scheduling system or standard practice. Yield was tracked monthly, with effects estimated via a linear mixed model accounting for depot-level variation.

This study provides causal evidence for operational improvements through structured field experimentation.

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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