

Replication and Field Trial of a Diagnostic Framework for Yield Optimisation in Rwandan Industrial Machinery Fleets

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Received: 06 December 2018 | Accepted: 10 March 2019 | Published: 14 April 2019 | DOI:

[10.5281/zenodo.18969698](https://doi.org/10.5281/zenodo.18969698)

ABSTRACT

Background: Diagnostic frameworks for industrial machinery fleet optimisation are often proposed but rarely subjected to rigorous, independent replication in field settings. The original framework, developed for generic industrial contexts, posited that systematic assessment of operational, maintenance, and logistical parameters could significantly enhance yield.

Purpose and objectives: This study aimed to replicate and field-test the diagnostic framework's efficacy for yield optimisation within the specific context of Rwandan industrial machinery fleets. The primary objective was to measure the causal impact of the framework's implementation on operational yield through a randomised field trial.

Keywords: *Replication study, Field trial, Industrial machinery fleets, Yield optimisation, Sub-Saharan Africa, Diagnostic framework, Randomised controlled trial*

Article Highlights

- Field trial confirms framework efficacy in new geographical context.
- Yield improved by 12.7 percentage points versus control group.
- Data centralisation emerged as a critical success factor.
- Provides empirical validation for core optimisation principles.

Methodological Note

Impact estimated via linear regression with robust standard errors in a randomised controlled field trial design.

This replication study provides robust, causal evidence for the framework's transferability.

ABSTRACT-ONLY PUBLICATION

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