

A Quasi-Experimental Framework for Yield Improvement Diagnostics in Tanzanian Industrial Machinery Fleets

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ABSTRACT

Background: Industrial machinery fleets in developing economies often operate below optimal yield, but robust diagnostic frameworks for systematic improvement are lacking. Existing evaluations are frequently descriptive or rely on retrospective data, limiting causal inference on intervention efficacy.

Purpose and objectives: This article presents a novel quasi-experimental framework designed to diagnose and measure yield improvement in industrial machinery fleets. The objective is to provide a structured methodology for engineering practitioners to identify causal drivers of performance gains.

Keywords: *quasi-experimental design, yield improvement diagnostics, industrial machinery fleets, Sub-Saharan Africa, maintenance engineering, operational efficiency, developing economies*

Article Highlights

- Presents a novel quasi-experimental framework for yield diagnostics in machinery fleets
- Employs difference-in-differences analysis with cluster-robust standard errors
- Demonstrates diagnostic power through simulated case study application
- Formalises attribution of yield changes to specific maintenance interventions

Methodological Innovation

First formalised quasi-experimental methodology tailored for yield diagnostics in industrial machinery fleets, enabling engineers to move beyond descriptive evaluations.

This methodology article presents a diagnostic framework rather than empirical results.

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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