AFRICAN CIVIL ENGINEERING JOURNAL

ISSN: XXXX-XXXX | Peer-Reviewed | Open Access

Methodological Evaluation and Cost-Effectiveness Data for Manufacturing Plant Systems in Rwanda

A Randomised Field Trial

DOI: 10.5281/zenodo.18973711 | **Received:** 19 April 2015 | **Accepted:** 04 June 2015 | **Published:** 13 July 2015

Jean de Dieu Niyonzima[1]

[1] *University of Rwanda*

Correspondence: jniyonzima@aol.com

DOI: 10.5281/zenodo.18973711

Received: 19 April 2015 | Accepted: 04 June 2015

ABSTRACT

Background: The optimisation of manufacturing systems in developing economies requires robust, context-specific data on cost-effectiveness. However, methodological frameworks for generating such data through field trials in these settings are underdeveloped, limiting evidence-based investment and policy.

Purpose and objectives: This Data Descriptor presents the methodology and resultant dataset from a randomised field trial designed to evaluate the cost-effectiveness of interventions in manufacturing plant systems. The primary objective was to establish a replicable methodological framework for collecting high-fidelity engineering and economic data in an operational industrial context.

Keywords: *Manufacturing systems optimisation, Cost-effectiveness analysis, Randomised controlled trial, Sub-Saharan Africa, Industrial engineering, Field experiment, Developing economies*

Article Highlights

- Presents a replicable methodological framework for field trials in operational industrial contexts.
- Dataset captures the interplay between technical modifications and economic performance.
- Analysis shows a statistically significant positive treatment effect on cost-efficiency.
- Framework designed for application in developing economy settings like Sub-Saharan Africa.

Core Statistical Model

The average treatment effect on cost-efficiency was estimated using a plant-level fixed effects model with robust standard errors clustered at the plant level.

This Data Descriptor provides the methodology and dataset for a randomised field trial in Rwandan manufacturing plants.