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Methodological Evaluation and Cost-Effectiveness Analysis of Manufacturing Plant Systems in Uganda

A Randomised Field Trial

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Aisha Nalwoga¹|David Kato^{2,3}|Julius Ochieng¹

¹ Gulu University

² Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

³ Department of Electrical Engineering, Kampala International University (KIU)

Correspondence: analwoga@hotmail.com

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ABSTRACT

Background: The systematic evaluation of manufacturing plant systems in sub-Saharan Africa is limited, with a paucity of rigorous field data on operational efficiency and cost-effectiveness. This gap hinders evidence-based investment and policy decisions in the region's industrial sector.

Purpose and objectives: This study aimed to methodologically evaluate and compare the cost-effectiveness of two distinct manufacturing plant systems—a modular, semi-automated system versus a conventional, labour-intensive setup—within the Ugandan context.

Keywords: *Manufacturing systems, Cost-effectiveness analysis, Randomised field trial, Sub-Saharan Africa, Operational efficiency, Plant evaluation*

Article Highlights

- Modular systems demonstrated 18.7% lower unit costs in a randomised field trial.
- First application of RCT methodology to compare plant systems in African industry.
- Findings support evidence-based investment in sub-Saharan manufacturing.
- Analysis controlled for scale using a generalised linear model with clustered errors.

Methodological Contribution

This study pioneers the use of a randomised field trial to evaluate manufacturing plant systems in sub-Saharan Africa, generating novel, high-certainty evidence for industrial policy.

This article presents primary field data from a controlled trial in Uganda.

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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