

POLICY ANALYSIS

# Methodological Evaluation and Multilevel Regression Analysis of Manufacturing Plant Systems for Yield Improvement in Uganda

Moses Mugisha<sup>1</sup>|Patience Nalwoga<sup>1</sup>  
Kato Ssekamanya<sup>1</sup>

<sup>1</sup> Makerere University Business School (MUBS)

Correspondence: [mmugisha@outlook.com](mailto:mmugisha@outlook.com)

Received: 30 January 2024 | Accepted: 22 May 2024 | Published: 06 July 2024 | DOI: [10.5281/zenodo.18968083](https://doi.org/10.5281/zenodo.18968083)

## ABSTRACT

**Background:** Manufacturing productivity in many developing economies is constrained by systemic inefficiencies. In Uganda, a critical gap exists in the rigorous, data-driven evaluation of plant systems to inform evidence-based industrial policy, particularly within the engineering sector.

**Purpose and objectives:** This policy analysis aims to methodologically evaluate manufacturing plant systems and quantify the determinants of yield improvement. The objective is to develop a robust analytical framework to identify key leverage points for policy intervention.

**Keywords:** *Manufacturing systems, Yield improvement, Multilevel modelling, Sub-Saharan Africa, Policy analysis, Process optimisation, Industrial development*

### Article Highlights

- Preventive maintenance explains ~22% of yield variance between Ugandan plants.
- Multilevel regression isolates plant-level from batch-level effects on performance.
- Findings advocate a policy shift from input subsidies to procedural investments.
- Provides a novel analytical framework for hierarchical manufacturing data.

### Policy Implication

Industrial support should target capacity in predictive maintenance and data analytics, moving beyond traditional equipment subsidies.

*This analysis quantifies systemic drivers of manufacturing yield using plant-level operational data.*

## **ABSTRACT-ONLY PUBLICATION**

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

## **REQUEST FULL PAPER**

 **Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## **SUBMIT YOUR RESEARCH**

**Are you a researcher in Africa? We  
welcome your submissions!**

Join our community of African scholars and share  
your groundbreaking work.

 **Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

### **Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global  
Knowledge