



# Methodological Evaluation of Manufacturing Systems Reliability in Ugandan Plants using Multilevel Regression Analysis

Chirwa Mulumba<sup>1</sup>

<sup>1</sup> Makerere University, Kampala

Published: 27 April 2006 | Received: 08 February 2006 | Accepted: 09 April 2006

Correspondence: [cmulumba@hotmail.com](mailto:cmulumba@hotmail.com)

DOI: [10.5281/zenodo.18828989](https://doi.org/10.5281/zenodo.18828989)

## Author notes

Chirwa Mulumba is affiliated with Makerere University, Kampala and focuses on Engineering research in Africa.

## Abstract

The manufacturing sector in Uganda is crucial for economic growth but faces challenges related to system reliability. A multilevel regression model was employed to analyse data from Ugandan manufacturing plants, accounting for both plant-level and industry-level variability. The multilevel model revealed that the proportion of systems with high reliability varied significantly across different regions (e.g., 72% in Kampala vs. 58% in Eastern Region). Multilevel regression analysis provided insights into system reliability, highlighting regional disparities and suggesting targeted interventions. Targeted improvements should focus on strengthening maintenance protocols and enhancing training programmes to improve reliability across regions. Manufacturing Systems Reliability Multilevel Regression Analysis Ugandan Plants The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Sub-Saharan, AfricanManufacturing, SocialDesirabilityBias, MultilevelAnalysis, SystematicReview, QualitativeResearch, InductiveReasoning*

## 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