



Bayesian Hierarchical Model for Measuring Adoption Rates of Manufacturing Plant Systems in Uganda

Musoke Mukasa¹

¹ Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

Published: 01 September 2010 | **Received:** 24 May 2010 | **Accepted:** 08 August 2010

Correspondence: mmukasa@aol.com

DOI: [10.5281/zenodo.18907927](https://doi.org/10.5281/zenodo.18907927)

Author notes

Musoke Mukasa is affiliated with Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit and focuses on Engineering research in Africa.

Abstract

Manufacturing plants in Uganda are adopting new systems to enhance productivity and efficiency. However, understanding the adoption rates of these systems is challenging due to variability across different sectors and companies. A Bayesian hierarchical model was employed, incorporating prior knowledge about the sectors' characteristics. Data on system installation and usage were collected from 150 randomly selected plants across three major sectors: food processing, textiles, and mining. The analysis revealed significant variation in adoption rates between sectors (e.g., food processing had a higher adoption rate than textile and mining sectors). The Bayesian hierarchical model provided insights into the drivers of adoption and highlighted differences by sector, offering a nuanced understanding of system implementation. Policy makers should tailor their support strategies based on sector-specific challenges to facilitate broader uptake of manufacturing systems. Bayesian Hierarchical Model, Adoption Rates, Manufacturing Plants, Uganda 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: *African economies, Bayesian statistics, hierarchical modelling, predictive analysis, diffusion theory, quantitative methods, stochastic processes*

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

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



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge