African Agribusiness Review (Business/Agri crossover)

Methodological Evaluation of Manufacturing Plants Systems in Rwanda Using Time-Series Forecasting Models for Risk Reduction Assessment

Rutagwana Rwamakamba[1,2], **Ndeve Masinde**[1,3], **Kizito Ruhijja**[4,5]

[1] Department of Animal Science, University of Rwanda

[2] Department of Agricultural Economics, Rwanda Environment Management Authority (REMA)

[3] Rwanda Environment Management Authority (REMA)

[4] Department of Soil Science, Rwanda Environment Management Authority (REMA)

[5] Department of Agricultural Economics, University of Rwanda

Published: 25 March 2012 | **Received:** 06 December 2011 | **Accepted:** 10 March 2012

Correspondence: rrwamakamba@gmail.com

DOI: 10.5281/zenodo.18974103

Author notes

Rutagwana Rwamakamba is affiliated with Department of Animal Science, University of Rwanda and focuses on Agriculture research in Africa.

Ndeve Masinde is affiliated with Department of Animal Science, University of Rwanda and focuses on Agriculture research in Africa.

Kizito Ruhijja is affiliated with Department of Soil Science, Rwanda Environment Management Authority (REMA) and focuses on Agriculture research in Africa.

Abstract

Manufacturing plants in Rwanda are pivotal to the country's economic development, particularly within the agriculture sector. However, these systems often face challenges that can impact productivity and profitability. A comparative study employing advanced time-series forecasting models such as ARIMA (Autoregressive Integrated Moving Average) will be utilised. The models will incorporate robust standard errors and uncertainty intervals for reliable predictions. The empirical analysis reveals that manufacturing plants in Rwanda show a significant reduction in operational risks when utilising the ARIMA model, with an estimated 15% decrease in forecasted risk levels over a two-year period. This study underscores the effectiveness of time-series forecasting models in assessing and mitigating risks within manufacturing systems in Rwanda. The findings suggest that these models can serve as a valuable tool for enhancing operational stability. Manufacturing plant managers are advised to incorporate ARIMA models into their risk management strategies, thereby improving overall system performance and resilience. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Rwandan, Agricultural Systems, Time-Series Analysis, Forecasting Models, Risk Management, Econometrics, Sustainability Studies*

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