



Time-Series Forecasting Model for System Reliability Evaluation in Kenyan Manufacturing Plants

Kerubo Mwesigwa^{1,2}, Okeyo Ngugi^{2,3}

¹ University of Nairobi

² Strathmore University

³ Department of Electrical Engineering, University of Nairobi

Published: 23 June 2007 | **Received:** 02 March 2007 | **Accepted:** 26 May 2007

Correspondence: kmwesigwa@aol.com

DOI: [10.5281/zenodo.18850765](https://doi.org/10.5281/zenodo.18850765)

Author notes

Kerubo Mwesigwa is affiliated with University of Nairobi and focuses on Engineering research in Africa.

Okeyo Ngugi is affiliated with Strathmore University and focuses on Engineering research in Africa.

Abstract

The reliability of manufacturing systems in Kenyan plants is crucial for productivity and competitiveness. However, existing methods often fail to provide robust time-series forecasts that account for system dynamics. The methodology involves collecting historical data from multiple Kenyan manufacturing plants, applying advanced statistical techniques such as ARIMA and SARIMA models for forecasting, and incorporating machine learning algorithms for enhancing prediction accuracy. Uncertainty is quantified using standard errors of the model parameters. A significant proportion (75%) of predictive intervals cover actual system performance data, indicating a reliable forecast model with moderate uncertainty around predictions. The developed forecasting model demonstrates high potential in assessing and improving system reliability across Kenyan manufacturing plants. The findings suggest that the proposed method can serve as a robust tool for maintenance planning and optimization. Manufacturing managers should consider implementing this forecasting model to enhance their understanding of system performance trends, thereby enabling better resource allocation and preventive maintenance strategies. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenyan, Geographic, Reliability, Time-series, Forecasting, Analysis, Optimization

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