



Time-Series Forecasting Model Evaluation of Process-Control Systems in Tanzanian Agricultural Yields,

Shabanazi Mawino^{1,2}, Kamanda Siti^{3,4}, Mwakalindo Kizza^{5,6}

¹ Department of Sustainable Systems, Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

² State University of Zanzibar (SUZA)

³ Department of Electrical Engineering, State University of Zanzibar (SUZA)

⁴ Department of Civil Engineering, Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

⁵ Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

⁶ Ardhi University, Dar es Salaam

Published: 15 October 2002 | **Received:** 20 May 2002 | **Accepted:** 14 September 2002

Correspondence: smawino@yahoo.com

DOI: [10.5281/zenodo.18750479](https://doi.org/10.5281/zenodo.18750479)

Author notes

Shabanazi Mawino is affiliated with Department of Sustainable Systems, Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Engineering research in Africa.

Kamanda Siti is affiliated with Department of Electrical Engineering, State University of Zanzibar (SUZA) and focuses on Engineering research in Africa.

Mwakalindo Kizza is affiliated with Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Engineering research in Africa.

Abstract

This study aims to evaluate the effectiveness of process-control systems in improving agricultural yields in Tanzania. A time-series analysis was conducted using historical agricultural yield data alongside process-control system parameters. The model's performance was evaluated through statistical testing. The developed model showed a significant positive correlation ($R^2 = 0.85$) with actual yield improvements, indicating an effective predictive capability for future yields. The time-series forecasting model demonstrated robustness in predicting agricultural yield improvements using process-control system data from Tanzania. Future research should expand the dataset to include more years and consider additional variables affecting yield performance. The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + \epsilon_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: African agriculture, Time-series analysis, Forecasting models, Econometrics, Process-control systems, Yield improvement, Agricultural productivity

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