African Large Animal Veterinary Practice

Forecasting Adoption Rates in Tanzanian Field Research Stations Using Time-Series Models: A Methodological Assessment

Makanga Simba[1], **Kamanda Mwelenchi**[2,3]

[1] State University of Zanzibar (SUZA)

[2] Department of Soil Science, State University of Zanzibar (SUZA)

[3] Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam

Published: 27 May 2006 | **Received:** 11 January 2006 | **Accepted:** 15 April 2006

Correspondence: msimba@hotmail.com

DOI: 10.5281/zenodo.18824120

Author notes

Makanga Simba is affiliated with State University of Zanzibar (SUZA) and focuses on Agriculture research in Africa.

Kamanda Mwelenchi is affiliated with Department of Soil Science, State University of Zanzibar (SUZA) and focuses on Agriculture research in Africa.

Abstract

This study aims to evaluate the effectiveness of time-series models in forecasting adoption rates at field research stations in Tanzania's agricultural sector. We employed a SARIMA (Seasonal AutoRegressive Integrated Moving Average) model to forecast adoption rates over multiple years in Tanzanian field research stations. The robustness of the model was assessed through cross-validation techniques. The SARIMA model demonstrated an R^2 value of 0.85, indicating that it accurately captured 85% of the variability in adoption rate data across various stations. The time-series forecasting models proved effective in predicting adoption rates at Tanzanian field research stations, offering a method for future resource planning and investment decisions. Investment in training programmes for researchers and stakeholders should be prioritised based on the forecasted adoption trends to maximise benefits from agricultural innovations. Agricultural Research, Field Stations, Adoption Rates, Time-Series Analysis, SARIMA Model The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, SARIMA, time-series analysis, forecasting, adoption rates, research stations, methodological assessment*