



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

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## 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  $Y = \beta_{0+\beta}^{-} p X + varepsilon$ , and inference is reported with uncertainty-aware statistical criteria.

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

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