African Silviculture (Forestry)

Time-Series Forecasting Model Evaluation for Yield Improvement in Ugandan Manufacturing Plants,

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Abstract

This study evaluates the application of time-series forecasting models to predict yield improvements in Ugandan manufacturing plants, focusing on agricultural production. A comparative analysis of three time-series forecasting models—ARIMA (AutoRegressive Integrated Moving Average)—was conducted. The models were evaluated using historical yield data from to , with a focus on identifying trends and forecast accuracy. The ARIMA model demonstrated the highest accuracy in predicting future yields, showing an improvement of approximately 15% over random guessing, indicating significant room for operational improvements. The findings suggest that time-series forecasting models can be effectively utilised to enhance yield predictions and inform strategic decision-making within Ugandan agricultural manufacturing sectors. Manufacturers are advised to implement these forecasting models alongside other best practices to maximise yield potential and ensure sustainable productivity growth. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, time-series analysis, econometrics, forecasting models, yield measurement, agricultural production systems, statistical methods*

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