



Time-Series Forecasting Model Evaluation for Risk Reduction in Kenya's Field Research Stations Systems

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Abstract

Kenyan agricultural research stations face challenges in risk management due to unpredictable environmental conditions. A time-series analysis was conducted using historical data from Kenya's field research stations. The ARIMA (AutoRegressive Integrated Moving Average) model was applied to forecast future conditions with uncertainty quantified through robust standard errors. The model predicted a 20% reduction in yield variability over the next five years, indicating improved risk management strategies are feasible. The ARIMA model effectively forecasts climate impacts on agricultural yields, providing actionable insights for risk mitigation. Implementing early warning systems based on forecasted data can enhance resilience against unpredictable weather patterns. ARIMA model, Time-series forecasting, Risk reduction, Climate impact, Agricultural research stations The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Kenya, Geographic Information Systems (GIS), Time Series Analysis, Monte Carlo Simulation, Risk Assessment, Precision Agriculture, Statistical Process Control

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