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TIME SERIES MODELING AND FORECASTING OF PADDY PRODUCTION IN SRI LANKA'S MAHA AND YALA SEASONS

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Abstract

Paddy cultivation is a vital component of Sri Lanka's agriculture sector, directly influencing food security and the rural economy. This study aims to model and forecast paddy production for the Maha and Yala seasons using annual time series data for the period 1952–2024, obtained from the Department of Census and Statistics. Autoregressive Integrated Moving Average (ARIMA) models were developed separately for each season after achieving stationarity through logarithmic transformation and first differencing. Model selection was based on the Akaike Information Criterion (AIC), Schwarz Criterion (SC), and log-likelihood measures. The optimal models identified were ARIMA (2,1,0) for Maha and ARIMA (1,1,1) for Yala seasons. Diagnostic tests confirmed the absence of autocorrelation and heteroscedasticity in the residuals, confirming the models' reliability. The models demonstrated high forecasting accuracy, with Mean Absolute Percentage Error (MAPE) values of 9.98% and 9.73% for Maha and Yala seasons, respectively. Forecasts for the period 2025–2029 indicate a steady upward trend in paddy production in both seasons, with consistently higher yields observed during the Maha season. These findings provide valuable insights for policymakers and agricultural planners, particularly in strengthening food security and optimizing resource allocation strategies.

Keywords: *ARIMA Model, Food Security, Maha and Yala Seasons, Paddy Yield, Time Series Forecasting*