



Time-Series Forecasting Model for Measuring Adoption Rates in Field Research Stations in Senegal

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Abstract

Field research stations in Senegal have been established to monitor agricultural productivity and environmental health over time. A time-series analysis was employed using an autoregressive integrated moving average (ARIMA) model for forecasting adoption rates over successive years. The ARIMA model indicated a significant increase in the rate of new agricultural techniques adoption from year to year, with a forecasted growth of at least 10% by the end of the study period. The time-series forecasting model provides a robust method for monitoring and predicting adoption rates of innovative farming practices among field research stations in Senegal. Adoption trends should be regularly monitored to inform policy adjustments aimed at enhancing agricultural productivity and environmental sustainability. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, agroecology, time-series analysis, forecasting models, adoption rates, spatial econometrics, agricultural productivity assessment*

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