

# **An empirical analysis on forecasting area, production and productivity of mustard: A case study in Jalpaiguri District of West Bengal**

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## **ABSTRACT**

Forecasting area, production, and productivity is vital for optimizing agricultural planning, stabilizing markets, and supporting economics. Accurate predictions help ensure resource allocation, price stability, and improved farmers' incomes. This study aims to forecast the area, production and productivity of mustard in Jalpaiguri district of West Bengal using ARIMA and ARIMAX. Annual data from 1977 to 2022 on mustard cultivation were analyzed alongside weather variables such as rainfall, maximum & minimum temperatures and data on fertilizer consumption. In this way ARIMA model, which accounts for past values and random shocks, was compared with the ARIMAX model, which incorporates exogenous variables. The findings revealed that the ARIMAX model outperformed the ARIMA model for area, production and productivity in terms of forecasting accuracy, with lower values of RMSE, MAE and MAPE. The study emphasizes the importance of accurate forecasting in agricultural planning, contributing to more efficient resource allocation and price stabilization. The results indicate a positive outlook for mustard cultivation in Jalpaiguri.

**Key words:** *ARIMAX, ARIMA, Exogenous variables and Forecasting*