Export forecasting of basmati rice and cotton from India: A comparative study of ANN and fuzzy time series approaches

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ABSTRACT

India plays a significant role in global trade through its agricultural exports, offering a diverse range of products to international markets. Among these, Basmati rice stands out for its distinctive aroma and superior quality, while Cotton is valued for its versatility in the textile industry and remains one of the major export commodities from India. The objective of this study is to identify the most suitable forecasting model by comparing the performance of Artificial Neural network (ANN) and Fuzzy Time Series (FTS) models. For this analysis, secondary data from 1990-1991 to 2023-2024 were collected for Basmati rice, and from 1970-1971 to 2023-2024 for Cotton and used to forecast the export quantities for the year 2026-2027. The models were assessed using diagnostic criteria such as Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE). The findings showed that the ANN model achieved the lowest error values compared to the Fuzzy Time Series model, indicating higher accuracy in forecasting the export quantities of Basmati rice and Cotton from India.

Keywords: *ANN, Basmati rice, Cotton, Fuzzy, Export*