ARIMA-Based Predictive Modelling for Turmeric Production in India

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Aim of the Study:

The primary objective of this research project is to conduct a comparative analysis of turmeric production in the Indian states of Odisha and Andhra Pradesh. By leveraging historical production data and employing the Autoregressive Integrated Moving Average (ARIMA) model, the study aims to forecast turmeric production for the upcoming years. The project seeks to determine whether Odisha's turmeric production will catch up with or fall behind that of Andhra Pradesh in terms of both area cultivated and total production.

Methodology:

The methodology encompasses several key steps:

1. Data Acquisition: From the given state-by-state production statistics, historical data on turmeric production will be gathered, including area and output figures from 2018-2019 to 2022-2023.

2. Data Pre-processing: To make sure the gathered data is appropriate for time series analysis, it will be cleaned and prepared.

3. Exploratory Data Analysis (EDA): To find trends, seasonality, and other pertinent patterns, preliminary data exploration will be carried out.

4. Stationarity Testing: To verify that the time series data is stationary, tests like the Augmented Dickey-Fuller (ADF) test will be used.

5. ARIMA Modelling: The ARIMA model will be fitted to historical production data after the ideal parameters (p, d, and q) have been established.

6. Forecasting: For the next few years, the production of turmeric will be predicted using the ARIMA model.

7. Comparative Analysis: To evaluate the production patterns, the projections for Odisha and Andhra Pradesh will be compared.

8. Evaluation: We will assess the model's performance using statistical measures like RMSE and MAE.

Keywords:

- Turmeric Production

- Odisha

- Andhra Pradesh

- ARIMA Model

- Time Series Forecasting

- Comparative Analysis

- Machine Learning

- Python

In addition to offering insights into the possible future of turmeric cultivation in these two important Indian states that produce spices, the research will advance knowledge of patterns in agricultural output. Agricultural data analysis and forecasting using machine learning approaches will be illustrated through the usage of Python's ARIMA modelling.