

PROJECT INFORMATION

Empowering Farmers with Machine Learning-Based Price Forecasts for Plantation Crops of West Coast of India

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Title of the Project

Empowering Farmers with Machine Learning-Based Price Forecasts for Plantation Crops of West Coast of India

Funding Agency

Anusandhan National Research Foundation (ANRF), Science and Engineering Board (SERB) - MATRICS Scheme, New Delhi

Total Outlay

6,60,000

Duration

3 years

Single / Multi-Institutional

Single

Principal Investigator

Dr. Shripad Bhat

Co-Investigators

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Rationale

Plantation crops such as black pepper, cashew, arecanut and coconut are extensively cultivated in the west coast of India (Maharashtra, Goa, Karnataka and Kerala). These crops support the livelihoods of lakhs of farm families in this region and are also popular in the world market: (i) black pepper, native to the west coast, is known for its quality globally; (ii) cashews, especially from Goa, are famous for taste and quality; (iii) arecanut and coconut are the major components of the conventional homestead system of gardening. However, price fluctuations of these crops affect the farm income and enhance the risk faced by farmers. Unlike perishable commodities, farmers can undertake on-farm storage for these crops for a substantial period before selling in the market.

Research Gaps

Farmers can store black pepper, arecanut, raw cashewnut and coconut for up to three years, two years, one year and six months, respectively. Timely price forecasts and market intelligence reports enable the farmer to undertake informed marketing decisions, such as whether to store or sell the produce, for better price realization.

Objectives

- To develop forecasting models for price analysis of important plantation crops of the west coast of India and identify the best-performing model
- To disseminate timely price forecasts and market intelligence reports of important plantation crops to west coast farmers to enable informed marketing decisions

Activities

Data on prices of these important plantation crops will be collected from major markets of the west coast of India through multiple secondary sources, mainly from the Directorate of Marketing & Inspection, Department of Agriculture & Cooperation, Ministry of Agriculture and Farmers Welfare, New Delhi (<https://agmarknet.gov.in/>). All the available daily price data for last 10-15 years will be collected for developing the forecasting models. Statistical software: Open-source software such as R (auto.arima package), Python (scikit-learn & Keras) and advanced MS Excel will be used.

Treatment Details
-
Fertilizer Doses
-
Variety
-
Replications
-
Observations to be Recorded
-
GPS Coordinates of Field (Lat , Long)
-
Expected Output
• Identification of the best-performing model for price forecasts of important plantation crops through machine learning approach
Expected Outcome
• Enhanced income of farmers due to informed marketing decisions
When the field was developed
-
What are crops being cultivated season-wise
-
Soil type
-
Soil pH, EC, OC
-
Soil depth
-
Soil NPK and Micronutrient status
-
Common pests and diseases
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