Agriculture price prediction using machine learning

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1. Introduction

- Objective: Develop a prediction model for crop prices in India to assist farmers and agricultural enterprises in making informed decisions and increasing profitability.
- Model will consider a range of crops, including wheat, paddy, and other widely used agricultural items.
- Model will take into account seasonality and weather factors that affect crop development and quality.
- Critical variables that influence crop prices are rainfall and the Wholesale Price Index (WPI).
- Accurate data gathering on these variables will be a priority in the research process.

Source: https://www.outlookindia.com/

2. Literature Review

- Agriculture is a crucial sector in India's economy, employing a significant portion of the population and contributing to the GDP.
- Kothari et al. (2019) discovered, for instance, that rainfall is a significant impact in affecting the pricing of commodities including wheat, paddy, and maize. The WPI has a considerable impact on crop prices in India, according to studies (Jaiswal et al., 2021).
- Kashyap et. al. (2021) created a machine learning model to predict crop prices in India. The model took into account factors such as precipitation, temperature, and demand in the market.
- Crop price forecasting in India is crucial for helping farmers and agricultural enterprises make informed decisions about crop sales to increase profitability.

Source: www.shutterstock.com

Source: www.Indianexpress.com

3. Research Objectives

- Identify the major determinants of agricultural prices in India, with a particular emphasis on rainfall and the Wholesale Price Index (WPI).
- using resources like Wikipedia and websites like statista.com to gather trustworthy and precise data on these variables within the Indian context.
- To create the model using machine learning techniques, test it, and assess the correctness and dependability of the model.
- To give farmers and agricultural enterprises a user-friendly interface so they can access the model's projections and decide on crop sales with knowledge.

4. Research Methodology

- Data cleaning will be done using Pandas Dataframes in Python to ensure accuracy.
- LSTM and other machine learning models will be used for prediction and forecasting.
- The SciKit learn module in Python will be used for creating accurate and reliable models and testing their performance.
- The data collected will be undergone through data cleaning process to obtain the optimum performance of ML models. Pandas Dataframes provided by python makes it easy for the cleaning process.
- LSTM and other machine learning models will be used to forecast and make predictions. SciKit learn library available in python will be used for the achieving this.

5. Early Indication and next steps

- According to an early study, rainfall and the Wholesale Price Index (WPI) are important factors influencing crop prices in India
- Analyzing the data in further detail and identifying the most important factors that affect crop prices using statistical methods like regression analysis.
- Identifying key factors influencing agricultural prices in India, with a focus on rainfall and WPI.
- Developing and testing the prediction model utilizing machine learning methods to ascertain which method offers the best accuracy and dependability, including LSTM and other models.
- Employing metrics like mean absolute error (MAE), mean squared error (MSE), and root mean square error (RMSE) to measure the model's performance and comparing the results to those of previous studies in the field.

6. Datasets

- Rainfall data: This data will be directly downloaded from Wikipedia.
- Wholesale Price Index (WPI) data for these crops will be collected from various sources on the internet.
- The website www.statista.com will be used as the primary source for WPI data.
- If WPI data for any crop is not found on this website, other reliable websites will be considered to collect the required data.

7. Technologies

References

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