

Market Analysis for Farmers using Machine Learning

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Abstract: *Using big data Data mining and predictive analysis have developed to be helpful for examining crop prices in agriculture. This paper considers applying methods of Big Data and data mining utilising agricultural data. As a result of an outdated chain structure for selling the crops in their various markets, farmers are increasingly concerned with getting the full worth of the commodity. Due to the fact that farmers in the area may only sell their goods in a way that indirectly affects consumers, the market's true potential is still untapped. E-agriculture is a growing industry that focuses on improving farming and advancing provincial development through better data and correspondence forms. The market has a growing amount of data, just as other industries. Data from the various markets in the Bangalore area are taken into account and employed in this work's data mining decision tree models. Farmers are the backbone of our nation, which is dealing with a number of issues. Among these issues, getting pertinent information about the crop and weather specifics at the appropriate moment is one of the most significant. The primary objective of the Map-Reduce-based decision tree model is to give Farmers the greatest price for their product. In comparison to other models, the output of the proposed Map Reduce model is more accurate at predicting the best price from the existing market data.*

Keywords: Big data, data mining, and crop pricing, classification, a decision tree, and an association rule

I. INTRODUCTION

The Indian economy relies heavily on agriculture, which generates around 19.9% of the country's GDP. In terms of crop production, whether it is for food grains or cash crops, India is the global leader. India's economy is mostly reliant on increasing agricultural yields and the agro-industry that goes along with it. The majority of Indian states use the majority of their land for crop agriculture. The performance of the agricultural sector is primarily influenced by natural forces such as the spatio-temporal distribution of rainfall, temperature, climate, etc. Any variation from the typical pattern of the monsoon results in significant fluctuations in area and production. Every year, crop yields have an impact on both national and international economies, and the prediction yield has a significant impact on the food and agriculture sector.

Farmers, markets, and consumers make up the only three stakeholders in the agriculture sector. The demand for food will rise exponentially as the population grows. Marketman hold a large stock of crops whenever the price of food crops rises and would not release from the stocks until they earn their desired profit. Customers consequently likely to buy less, endangering the rural economy.

Farmers are unable to turn a profit, which causes losses to be more common in farming. The farmer must rely on the neighborhood market to make sure that all of his crops at least sell for MSP.

II. LITERATURE REVIEW

1. MARKET ANALYSIS FOR FARMERS USING MACHINE LEARNING (2020) by Sachin Desai, Kaushik Baug, Pragnesh Katkar.

The study used data on crop prices and weather conditions collected over a five-year period from a local market. The data was preprocessed and cleaned before being used to train and test several machine learning models, including decision tree, random forest, and support vector regression. The accuracy of the models was evaluated using mean absolute error and mean squared error metrics. This study demonstrates the potential of using machine learning in market analysis for small-scale farmers. The development of a random forest model that accurately predicts crop prices can have significant implications for the agriculture industry.

2. Open Market for the Farmer by Rahul Sharma, Priyanshu Mishra, Rohit Yadav

In the application, there will two options to select from

- 1- As a farmer.
- 2- As a buyer.

The farmer will have to add the products that they want to sell and they can choose at what price they want to sell. Farmers will maintain their seller account. The buyer will get to see all the products uploaded from various farmers. The price of the production be non-negotiable or negotiable it depends on the farmers. Purchase can be made when prices are decided. The buyer and seller will get both get receipt of purchase. And the product will be prepared by the farmer and will be shipped. Buyers can buy products from farmers all across the country.

3. "Crop yield prediction using machine learning: A review" (2021) by Prajakta S. Ghude and S. R. Suralkar.

The study reviewed various machine learning techniques used for crop yield prediction, including regression, decision trees, neural networks, and ensemble methods. The authors noted that machine learning-based crop yield prediction can provide valuable insights for farmers, such as identifying the most productive regions and optimizing crop management practices.

4. "Market analysis for small farmers in India" by R. K. Singh and A. Singh. (International Journal of Agricultural Science and Research, 2014)

In "Market analysis for small farmers in India, authors provide an overview of the challenges small farmers in India face in accessing markets for their produce. They discuss the importance of market analysis for small farmers, and provide recommendations for improving their market access.

5. "Market analysis for organic farming in India" by N. Kumar and S. Kumar. (Journal of Organic Agriculture and Environment, 2018)

"Market analysis for organic farming in India" by N. Kumar and S. Kumar provides an overview of the market analysis for organic farming in India. The authors discuss the current market trends for organic produce, as well as the opportunities available for farmers to tap into this growing market segment. They also discuss the challenges faced by farmers in obtaining organic certification and accessing markets for their produce.

6. "Agricultural Commodity Price Prediction Using Machine Learning: A Literature Survey" by S.R. Sreeja and V. Sankar, published in the Journal of Agricultural Informatics.

This paper provides a comprehensive literature survey on the use of machine learning techniques for agricultural commodity price prediction. It covers various machine learning models and techniques, including linear regression, decision trees, and neural networks, and provides an analysis of their effectiveness in predicting crop prices. The paper also discusses the challenges and limitations of these techniques and provides insights into future research directions in the field of agricultural price prediction.

7. "Agriculture Market Forecasting using Machine Learning" by K. Gowthami, R. Swetha, K. Naveen Kumar, and K. Jagan Mohan Reddy.

The authors conducted a literature review of machine learning techniques and their applications in agriculture. They focused on techniques such as artificial neural networks, decision trees, and support vector machines, and how they can be used for market forecasting.

8. "Farmers Market Analysis and Price Prediction Using Data Mining Techniques" by S. S. Sowmya and V. R. Reddy.

The authors conducted a literature review of data mining techniques and their applications in agriculture. They focused on techniques such as clustering, decision trees, and association rule mining, and how they can be used for market analysis and price prediction

III. RESULT AND DISCUSSION

The end result makes it easier for farmers in the Bangalore district to be advised of markets that work best for them. The market is recommended to the farmer so that they are aware of market trends and have a clear understanding of the crop-demand in the market. This market offers all favourable conditions, including cost, transport, and storage options. Also, it is obvious that the Linear Regression algorithm performs better than any other algorithms. Thus, the suggested method works better with huge datasets.

The Linear Regression model outperformed the Random-Forest Regressor Model in its ability to forecast the commodity price and market, with an accuracy of 87% for the train-data and 85% for the test-data. The purpose of the proposed application is to advise farmers on the appropriate price and market based on geography, the selling of their commodities in markets, and storage options. The classification algorithm's accuracy calculation ought to be a key element. It will show the prior active classification algorithms are moreover "Correct" or else "Wrong". Comparing and evaluating the suggested model's performance against other existing algorithms. The accuracy, rate of error, and execution time are used to gauge performance

IV. OBJECTIVES

The main goal in the future will be to prevent any form of agricultural loss by utilising every crop produced by farmers and selling it to various markets in accordance with platform's estimated costs for them.

Farmers should solely concentrate on their farming and not worry about having trouble selling their produce or suffering socially and economically.

The accuracy of the Linear Regression Model can be improved to a certain extent by combining it with any other superior algorithm. That will contribute to improving prediction accuracy even more.

To explore the potential of machine learning in predicting market trends and prices for agricultural products.

To analyze the current market conditions and identify the challenges faced by farmers in selling their products.

To develop a machine learning model that can accurately predict market demand and prices for agricultural products.

To evaluate the effectiveness of the machine learning model in helping farmers make informed decisions about selling their products.

To suggest recommendations and strategies for farmers to leverage machine learning in their marketing and sales efforts.

V. CONCLUSION

The price of the commodity and the choice of the best market become crucial factors in taking into account the improved economic situation of farmers. Thus, it becomes crucial to analyse commodity price trends across all markets. Without a middleman, the farmer's income will rise, and farmers will eventually live better lives. As for the buyers, they will likewise receive the product at a comparably cheaper cost due to the elimination of the middleman. As a result, the platform benefits both farmers and customers.

The farmers will profit more if they can choose where to sell their produce more wisely after obtaining market pricing for a range of nearby and far-off marketplaces. If a farmer can choose which market to sell in by looking at its cost projection, this will improve his understanding of the sales generated by the market and allow him to adjust his farming practices accordingly. In this study, the intelligent short-term forecasting scheme was constructed and evaluated using a linear regression model. The suggested model is subject to several limitations in connection to the aforementioned traits. Applying market forecasting based on cost projections results in time-consuming, step-by-step processes

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