Helping farmers in avoiding crops price crash

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Aim of the Project

To help farmers prevent themselves from price crash in agricultural commodities.

Price crash is an imminent issue faced by farmers in our country.
Farm crisis has been faced owing to worst price slumps in 18 years at a point in time the previous year.

Analyzing the various factors affecting cultivation and price crash like previous trends in demand , supply , exports of various kinds of crops will help us forecast beforehand when can a price crash situation arise .

This will help in alarming the farmers regarding the same so that they can cultivate the crops accordingly .

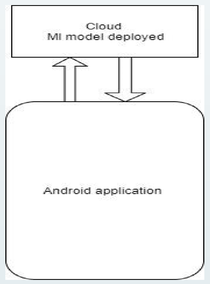
Introduction

The financial year, 2018-19 ended up being the worst year for farm incomes in almost two decades, government data indicates in a revelation that emphasises the gravity of the ongoing agrarian crisis. According to Wholesale Price Index (WPI) data for the month of December released on Monday by the ministry of commerce and industry, the WPI sub-component for primary food articles has been negative for six consecutive months beginning July 2018. This means their prices are falling. The WPI sub-component for food components was -0.1% in December. It was -2.1%, -4%, -0.2%, -1.4% and -3.3% in the preceding five months. The last time WPI for primary food articles showed negative annual growth for two consecutive quarters was in 1990.[1]
Rabi crops , of all, are said to be affected by price crash the most. Although the government had proposed a 7% increase in the Maximum Selling Price (MSP) of these kinds of crops , the central issue still remains unsolved as prices in domestic and international market are subject to crashing anytime.
Therefore, our focus needs to be to educate farmers on the various factors leading to change in prices of agricultural products. For this, thorough analysis of open source data on production , price,export & import needs to be done and for that , we use the tools of data analysis wherein with the use of data visualization techniques , feature scaling and selection , and machine learning algorithms, we can try to perform future price prediction and determine the amount of domestic production required to maintain the stability of price of agricultural products.

Methodology

The Machine learning model for prediction and analysis is deployed on the cloud for faster execution . An android application is to be used to connect to the cloud through the api. The MI model will will be trained on the cloud and the prediction will be displayed on the android application. Running the ML model on the cloud will make the android application less in size and more responsive . Farmers will use the android application to to know about the various information. The user interface of the application is very user friendly so, that farmer can use it efficiently.

The android version of the smartphone must be 4.0 or higher to support the application's features. The application will require a decent internet connection to connect to the server(cloud). The application will not require very high ram , 2 gb of ram will be sufficient to run the application smoothly.

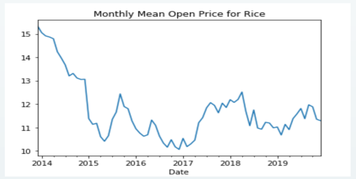


Technology used

We have used Python version 3.6.5 to have a good implementation and compatibility with all the libraries.The Integrated Development Environment in this case will be IDLE.Python is completely free as it is open source software. Users can easily install it on their own computer and use the standard and extend library.
First , we use built-in python libraries - numpy , pandas and matplotlib for analyzing and visualizing the raw data. Numpy and pandas are used for data collection and data manipulation. Matplotlib helps us in visualization as we can plot interactive charts to get a good view of trends in the data . After analyzing the data carefully , we make use of Machine Learning - classification algorithms to accurately predict the chances of price crash and provide alternatives to crops to avert price crash and maintain price stability. SciKit–learn is an open source machine learning library for the Python programming language. It has various classification, regression, and clustering algorithms and is designed to interoperate with the Python numerical libraries NumPy and Scipy.

Implementation and Results

Our analysis of various datasets have given us a lot of insight on the trends in the production , price and trade of various crops on a year on year basis . As per our hypothesis , production , exports and imports are contributing factors in our forecast . They together help deciding the final market price of the agricultural product. More exports means demand for domestic product is on the rise whereas more imports might lead to low demand for domestically produced good and decrease in price because of oversupply



As we can see 2014-15 saw a huge fall in the stock value . This is a typical example of price crash.

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Conclusion

To teconclude , we envisage the use of our proposed application to the benefit of farmers and the agricultural community as a whole in combating the single biggest issue faced at the farm. Advancements in technology like Machine Learning has enabled us to work towards solving farm crisis and will continue to do so . This paper shows the various factors which will be used during the process of building the model and thus, leads us to the inference that the importance of both external factors (international stock price , exports , imports) and internal factors (production yield) has to be known to have a clear and accurate prediction.

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