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Agriculture 1O1

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Abstract**: Agriculture is the backbone of Asian nation and therefore the farmer may be a crucial component of it. Agriculture is primary and ancient occupation of Asian nation, and it's a supply of support for many of the population residing in India. Agriculture sector desires plenty of public sector support for a property growth. Government has issued varied schemes and incentives to the farmers to supply them social and monetary security. The introduction of contemporary techniques in agriculture sector has helped boost-up the productivity level, alongside an improvement in price and labor used. Trendy agricultural technique's area unit dynamic approach to agricultural innovations and farming practices that helps farmers increase potency and cut back the number of natural resources required to satisfy the world's food, fuel and fiber demands. Value prediction may be a huge issue for farmers WHO don't seem to be tuned in to the market costs. Foretelling value of agriculture commodities helps the farmers to foresee the market and grow appropriate crop to maximize profit. Forecasting weather API provides information regarding the longer term weather, so farmers will pre-plan their agricultural activities. For forecasting of weather, we tend to record the pattern of weather of past few days and so predict the longer-term weather. Farm Profit Calculation provides farmers a tool to grasp a way to maximize monetary potency for his or her operation. We wish farmers to urge the foremost bang for his or her buck, and learn wherever they'll cut back inputs while not touching their bottom line. Hoarding is an act of aggregation great amount of merchandise and keeping it to yourself to extend the market value. Farmers encounter high production prices in their efforts to spice up production however hardly get truthful rating of their merchandise from the middlemen. Therefore, farmers will keep track on activities of the middlemen. Thus, the system helps the farmers to ease their life.

Keywords: Weather, Price Prediction, Hoarding, Profit.

I. INTRODUCTION

The agriculture is one amongst the foremost vital occupation in Asian country. It's the large sector and plays a vital role in overall development of the country. The kind of soil and therefore the variety of crops becomes terribly vital from agriculture financial gain purpose of read. The agriculture is incredibly vital and so can lead the farmers of our country towards profit. Quite half the land is employed for agriculture to fulfill the wants of the population of the region. To fulfill the wants, modernization in agricultural practices is needed [5]. Because of several challenges like variation in climate, organic phenomenon and abiotic stress conditions at the height amount of crop, natural calamities loss the crop yield after we used the standard farming systems. New techniques/systems area unit employed by the farmers however the speed of adaptation of recent technologies by the farmers is slow because of lack of awareness amongst the farmers in some rural areas [7]. We've got detected in gift times that the climate is ever-changing persistently that is harmful to the crops and leading farmers towards debts and suicide [3]. In Republic of India there are a unit many ways in which to extend the economic growth within the field of agriculture. There are a unit multiple ways in which to extend and improve the crop yield and therefore the quality of the crops. Data processing additionally helpful for predicting the crop yield production. This internet application is additionally want to offer forecasting to predict atmosphere of a location. An efficient crop price prediction system offers farmers opportunities that may profit individuals during a larger context and might give out prospects for purchasers which might satisfy the purchasers to a larger context [5]. Middlemen operate altogether the continents of the globe particularly wherever the economy is booming. These teams of individuals act as mediator between the producers (farmers) and therefore the customers. Within the method of lease food or different agricultural materials reach the ultimate client (user), the worth is marked up to hide transportation, storage and profit. During this advanced system, we tend to attempt to solve two issues geared toward empowering granger farmers and low-income customers. First, to assist the farmers get an improved value for his or her manufacture, we tend to build a crop price prediction model that may predict costs into the long run, and might help farmers create an improved call of once to sell their manufacture. Second, to assist low-income customers United Nations agency area unit affected badly by high costs, and United Nations agency conjointly tend to be granger farmers themselves, we tend to build a hoarding detection to strengthen regulative mechanisms within the operation of agricultural markets within the country [6]. During this paper, we tend to aim to style an internet site as an instance the various forms of agricultural services and edges which might be useful to farmers for choice of higher crop.

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II. PROBLEM STATEMENT

More than half of population is dependent on agriculture. However, farmers still lack in knowledge about the latest government policies, usage of modern method and harvesting techniques and in addition to it, they also lack in advanced techniques of prediction of crop yield at the time of sowing.

Prior prediction of crop price can be helpful in early determination of factors leading to decline in production. Farmers are unaware of illegal hoardings done by middlemen to increase prices of the crop.

Many researches have been conducted to develop an efficient method for crop prediction, but focus has been always on statistical techniques and not much has been done in machine learning approach. Nowadays, Weather plays a very important role in farmers daily life.

Weather makes farmer to plan his/her day-to-day activities. This project proposes a web application to forecast weather. Profit prediction can also be useful for farmers to calculate overall profit including various losses.

III. LITERATURE REVIEW

1) "Web Based Agriculture Information System" by O.N.N. Fernando and G.N. Wikramanayake:

In this paper, objective is to introduce an agricultural information system on the Internet so that it will eventually allow potential users to query and obtain the desired information. The data of this system is to be stored using a central database and maintained by the main research institutes. System is to be portable as the computer system that maintains this data may change from time to time. This paper describes the design and development of an agricultural information system.

2) "Predicting yield of the crop using machine learning algorithm" by P. Priya, U. Muthaiah & M. Balamurugan.

This paper focuses on predicting the yield of the crop based on the existing data by using Random Forest algorithm. Real data of Tamil Nadu were used for building the models and the models were tested with samples. Random Forest Algorithm can be used for accurate crop yield prediction. The system is based on one specific region only and the yield is calculated based on rainfall which farmers are unable to get.

3) "Weather Forecasting & Crop Recommendation" by Prof. Anil Hulsure, Yogesh Kale, Aditya Kalekar, Vijay Ganesh.

In this paper, the system uses web application to display current, future and historical weather according to the given location with the help of API. Collaborative filtering is used for crop recommendation. It provides better accuracy of weather and is more efficient.

4) "Agriculture Commodity Price Forecasting using ML Techniques" by Varun R, Neema N., Sahana H. P., Sathvik A., Mohammed Muddasir.

The system predict the prices of crops using data science algorithms. System predicts price based on the attributes such as date, yield, max trade, min trade, etc. There is direct communication between farmers and customers. Allows the farmer to anticipate the best yield in terms of quality and quantity. No role of middlemen and therefore no loss of farmers and customers. The price is influenced by different variables like its characteristics, demand, seasonal trends, etc.

5) "Crop price prediction using supervised machine learning algorithms" by Ranjani Dhanapal, A AjanRaj, S Balavinayagapragathish, J Balaji.

In this decision Tree Regressor is used for prediction and predicts the price of crops and forecast the price for the next 12 months. It is trained on several Kharif and Ragi crops (Paddy, Wheat, Cotton, Barley, etc) providing better accuracy. Datasets provide ample insights to forecast the required price and demand in the markets. Therefore, the scheme allows farmers to reduce their problems and raise their income.

6) "Implications of middlemen in the supply chain of agricultural products" by Oguoma, o.N., V. I. Nkwocha, and i. I. Ibeawuchi.

The roles of middlemen in the distribution of agricultural products and the inherent implications to food security are appraised. The result showed that farmers encounter high production costs in their efforts to boost production but hardly get fair pricing of their products from the middlemen, the bulk farm gate buyers. The study observed that there were several challenges involved in marketing of agricultural products.

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7) *"Modern Farming Methods: An Initiative towards Increasing the Food Productivity" by Sonam S. Kale1, Kishor P. Panzade, Narendra R. Chavan.*

Various new technologies used in farming is discussed in the paper. The uses of new modern techniques get more productivity of crops in less land with reference to good environmental health. Modern Farming increase productivity, improve living standard of farmers, growth in economy of country.

IV. PROPOSED SYSTEM

The proposed system is an agriculture-based website which can be used by farmers to ease their life. It would be very useful for farmers before harvesting any crop and will keep them updated. The website provides services which are discussed below:

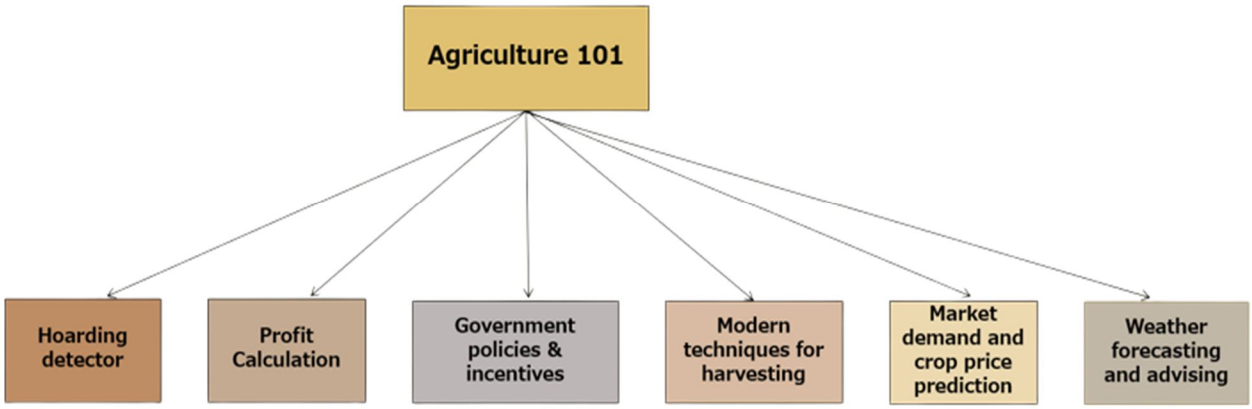


Fig 4.1: Block Diagram

1) *Hoarding Detector:* Hoarding is an act of collecting large amount of products and keeping it to yourself to increase the market price. Hoarding Detector will detect illegal hoarding of commodities by middle-man. After selling the commodities to middle-man, the farmer will upload the invoice or sale data on the portal. This data will contain details of middle-man, commodities and other relevant data. When middle-man sells commodities to the market, he/she also has to upload the sale data on the portal. This will ensure proper supply chain is maintained. If there is drastic change in the price of commodities due to illegal hoarding, the farmer will get to know all the middle-man who are hoarding.
2) *Profit calculation:* The aim of profit calculation is to determine profit taking into aspect various losses, weather condition and the predicted market price. Users will give input about the crop which he has to produce, area of the land and type of soil. Based on the above data Total production will be calculated on the basis of area. Then taking into consideration the losses i.e., due to transportation, losses in various agricultural processes and losses due to weather the actual production will be calculated. This will help farmers to choose right crop so that he can maximize his profits.
3) *Market Demand and Crop Price Prediction:* Based on previous years' data analysis, market demand and expected price for crops will be predicted. This feature will enable farmers to foresee the market and grow the suitable crop to maximize the profit. It will help farmers to know that which crop to be produced according to the last few years' data analysis in commodity market.
4) *Weather Forecasting and Advising:* In addition to above feature weather will be forecasted based on location or zip code so that farmers can pre-plan the agricultural activities. This will help farmers to minimize loss occurred due to unexpected climatic weather. It will help farmers to know what precautions and care should be taken to avoid loss of agricultural items due to uncertain climatic change.
5) *Government Policies and Incentives:* It will show important government the latest policies, news, incentives and subsidies. It will also be user specific and region specific. It will help the Farmers to know various ongoing policies & subsidies in which they fit according to region, annual income, etc.
6) *Modern Techniques for Harvesting:* In this feature we will provide information about modern techniques for betterment in agricultural field. This will enable farmers to minimize loss, maximize profit and reduce human efforts and time. It will help farmers to know about modern machines & techniques which will help them in quality farming. Modern machines will increase their speed during farming. Modern ways and Modern machines will reduce the labor efforts and also save their time.

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V. RESULTS DISCUSSION

The website is developed using python and flask framework and runs on Google Chrome, Microsoft Edge, etc. The website is hosted by localhost. The work flow of the website is as below:

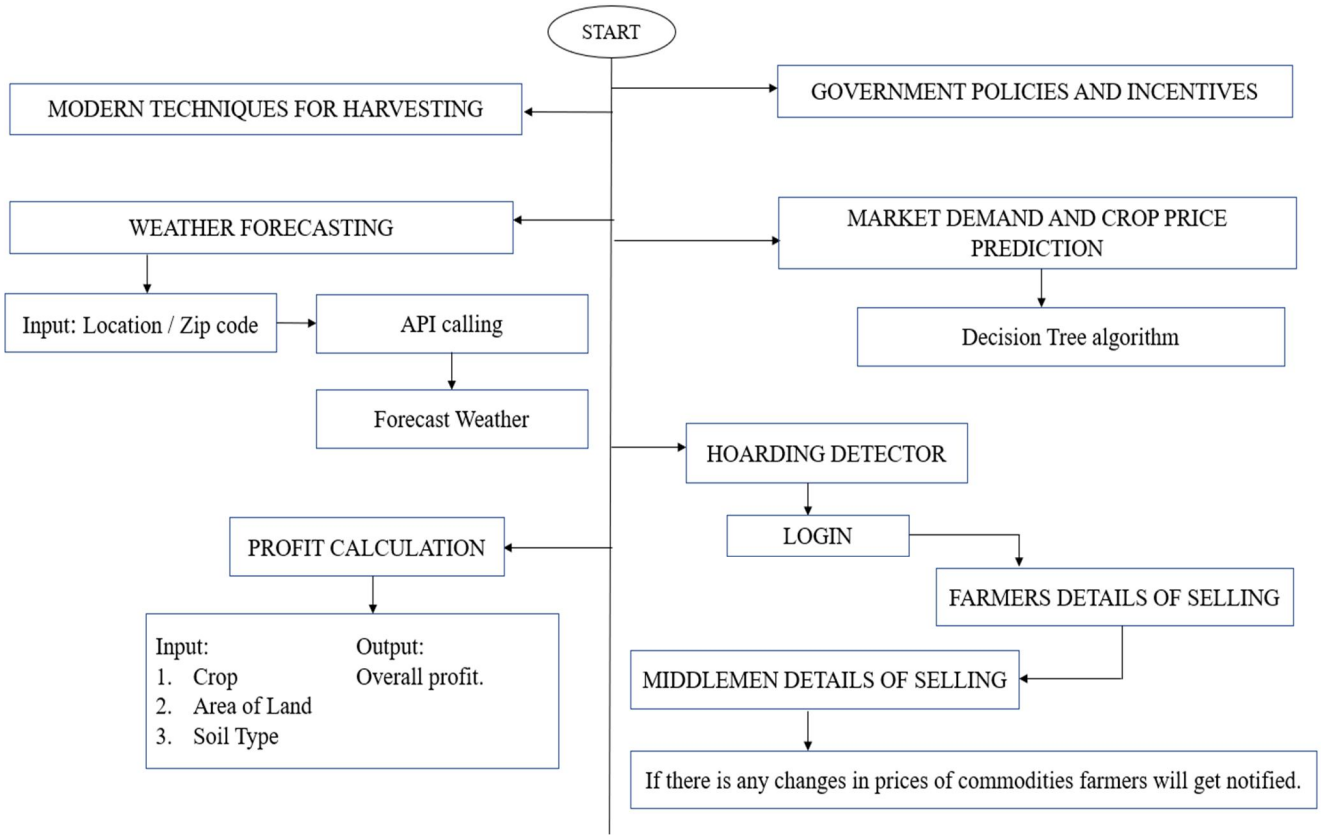


Fig 5.1: Work Flow

As discussed in proposed system, there are six services provided in website. In government policies and incentives section, Farmers can view various schemes, news and incentives which would provide financial support. Modern Techniques for harvesting will display latest and easy farming techniques and machines used for agricultural activities. Market demand and crop price prediction display the top five gaining and losing crops based on market prices. This is implemented using decision tree algorithm which predict target variables by simple decision rules inferred from training data. Dataset of various crops is provided for training data which includes month, year, WPI, rainfall. Also, farmers can explore by each commodity to see the predicted and previous year prices along with graphical representation of prices. In Weather forecasting and advising section, farmers enter location/zip code and seven days weather is forecasted using API calling. Openweathermap API is used which forecasts weather by taking previous few days weather record. If there is uncertain change in the temperature, necessary precautions for crops are also suggested. Profit calculation is used to calculate overall profit for total crop production based on area. In hoarding detection farmers can register and login and can fill the details about the commodities sold to middlemen, after selling the commodities in market middlemen will also fill the details on the website. Farmers can see the data fill by middlemen and if there is any changes/hike in prices farmers can see which middlemen are hoarding the commodities.

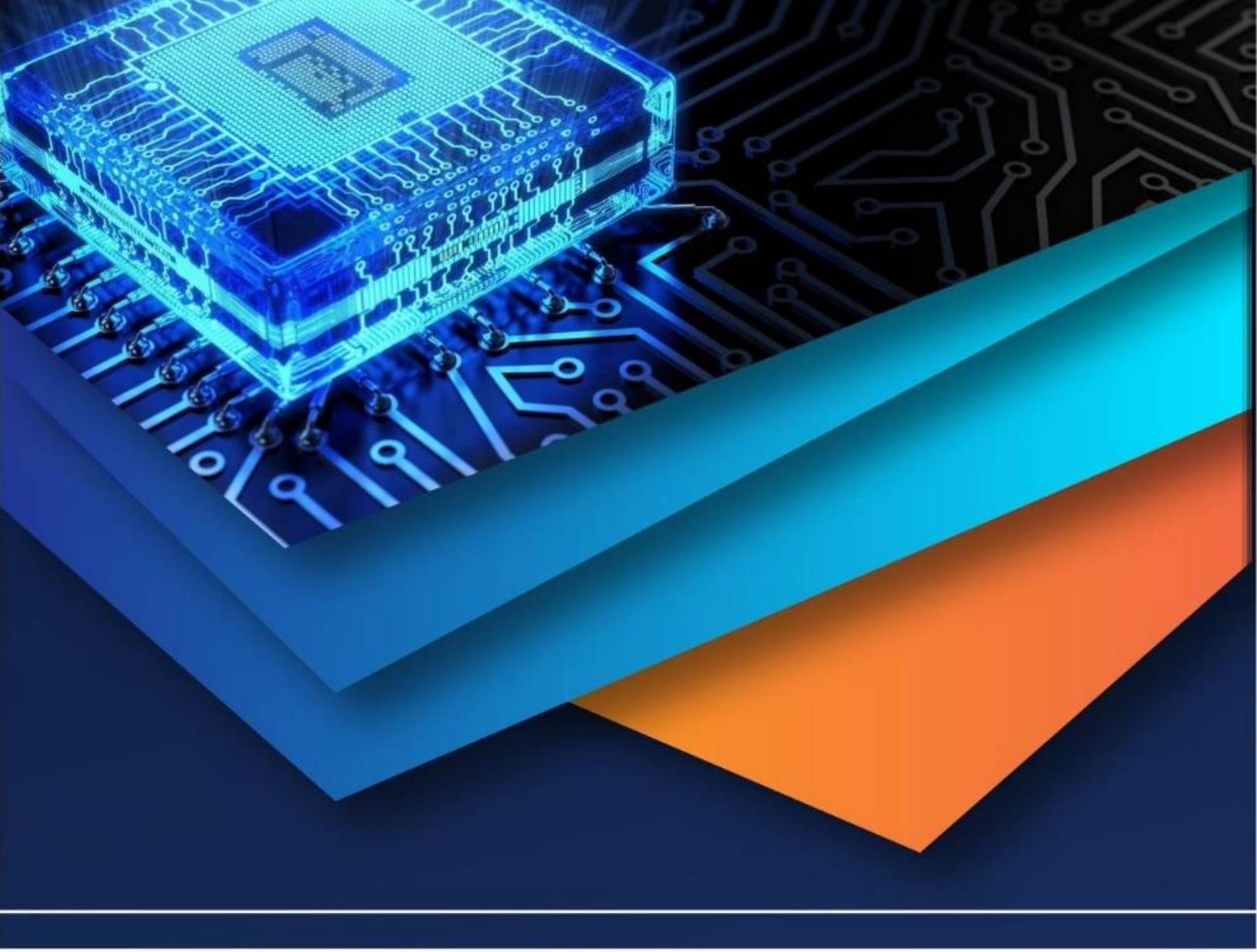
VI. CONCLUSION

Presently our farmers are not effectively using technology and analysis, so there may be a chance of wrong selection of crop for cultivation that reduces their income. To reduce those type of loses we have developed a farmer friendly system with good interface, this system provides information about expected yield, market price and illegal hoarding detection and also farmers stay updated about the latest government schemes and new technology used in farming. The output is currently a web application, but our future work would be building an application where the farmers can use it as app and converting the whole system in their regional language.

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