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Agricultural Crop Recommendation Based on Productivity and Season

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ABSTRACT: As a coastal state, Tamil Nadu faces uncertainty in agriculture which decreases its production. With more population and area, more productivity should be achieved but it cannot be reached. Farmers have words-of-mouth in past decades but now it cannot be used due to climatic factors. Agricultural factors and parameters make the data to get insights about the Agri-facts. Growth of IT world drives some highlights in Agriculture Sciences to help farmers with good agricultural information. Intelligence of applying modern technological methods in the field of agriculture is desirable in this current scenario. Machine Learning Techniques develops a well-defined model with the data and helps us to attain predictions. Agricultural issues like crop prediction, rotation, water requirement, fertilizer requirement and protection can be solved. Due to the variable climatic factors of the environment, there is a necessity to have a efficient technique to facilitate the crop cultivation and to lend a hand to the farmers in their production and management. This may help up coming agriculturalists to have a better agriculture. A system of recommendations can be provided to a farmer to help them in crop cultivation with the help of data mining. To implement such an approach, crops are recommended based on its climatic factors and quantity. Data Analytics paves a way to evolve use full extraction from agricultural database. Crop Dataset has been analyzed and recommendation of crops is done based on productivity and season

I. INTRODUCTION

Tamil Nadu being 7th largest area in India has 6th largest population. It is the leading producer of agriculture products. Agriculture is the main occupation of Tamil Nadu people. Agriculture has a sound tone in this competitive world. Cauvery is the main source o f water. Cauvery delta regions are called as rice bow l of Tamil Nadu. Rice is the major crop grown in Tamil Nadu. Other crops like Paddy, Sugarcane, Cotton, Coconut and groundnut are grown. Bio-fertilizers are produced efficiently. Many areas Farming acts as major source of occupation. Agriculture makes a dramatic impact in the economy o f a country. Due to the change of natural factors, Agriculture farming is degrading now-a-days. Agriculture directly depends on the environmental factors such as sunlight humidity, soil type, rainfall, Maximum and Minim um Temperature, climate, fertilizers, pesticides etc. Knowledge of proper harvesting of crops is in need to bloom in Agriculture. India has seasons of

1. Winter which occurs from December to M arch
2. Summer season from April to June
3. Monsoon or rainy season lasting from July to September and
4. Post-monsoon or autumn season occurring from October to November.

II. LITERATURE SURVEY

The Impact of Data Analytics in Crop Management based on Weather Conditions
Authors: A.Swarupa Rani
Agriculture is the most significant application area particularly in the developing countries like India. Data mining plays a crucial role for decision making on several issues related to agriculture field. The goal of the data mining process is to extract knowledge from an existing data set and transform it into a unique human understandable format for some advance use. Crop management of certain agriculture region is depends on the climatic conditions of that region because climate can make huge impact on crop productivity. Real time weather data can helps to attain the good crop management. Utilization of information and communications technology enables automation of extracting significant data in an effort to obtain knowledge and trends, which enables the elimination of manual tasks and easier

data extraction directly from electronic sources, transfer to secure electronic system of documentation which will enable production cost reduction, higher yield and higher market price. Also identified that how the data mining helps to analyze and predict the useful pattern from huge and dynamically changed climatic data. In agricultural and biological engineering, researchers and engineers have developed methods of fuzzy logic, artificial neural networks, genetic algorithms, decision trees, and support vector machines to study soil, climate conditions and water regimes related to crop growth and pest management in agriculture. In this paper summarizes the application of data mining techniques, Neural Networks, Support Vector Machine, Big Data analysis and soft computing in the agriculture field base on weather conditions.
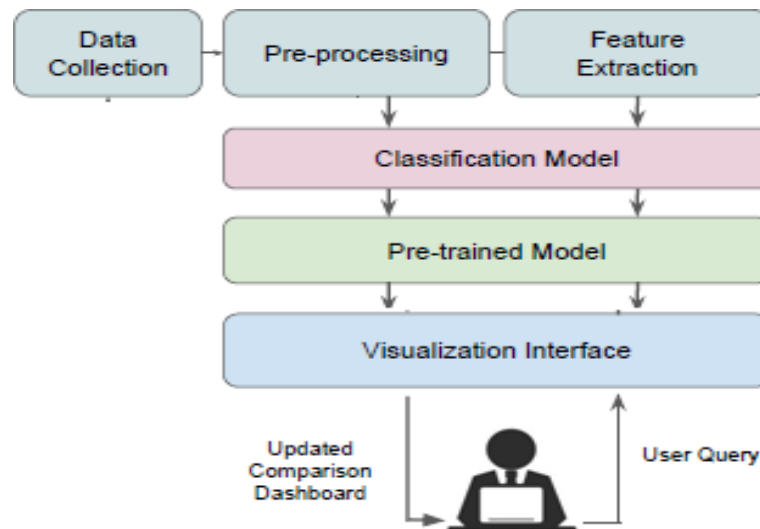
III. SYSTEM DESIGN

Figure 1: System Architecture

IV. RESULTS AND OUTCOMES

Data Collection: This is the first real step towards the real development of a machine learning model, collecting data.

Dataset: The dataset consists of 821 individual data. There are 14 columns in the dataset, which are described below. features states, rainfall, ground water, tempreture, soil type, season, crops, fertilizers required, cost of cultivation, expected revenues, quantity of seeds per hectare, duration of cultivation, demand of crop, crops for mixed cropping.

Data Preparation: Wrangle data and prepare it for training. Clean that which may require it(remove duplicates, correct errors, deal with missing values, normalization, data type conversions, etc.)

Outcomes:

Model Selection: A decision tree is a flowchart-like tree structure where an internal node represents feature(or attribute), the branch represents a decision rule, and each leaf node represents the outcome. The topmost node in a decision tree is known as the root node.

Analyze and Prediction: In the actual dataset, we chose only 7 features states, rainfall, ground water, tempreture, soil type, season, crops.

Accuracy on test set: We got a accuracy of 90.7% on test set.

Saving the Trained Model: Once you're confident enough to take your trained and tested model into the production-ready environment, the first step is to save it into a .h5 or .pkl file using a library like pickle .
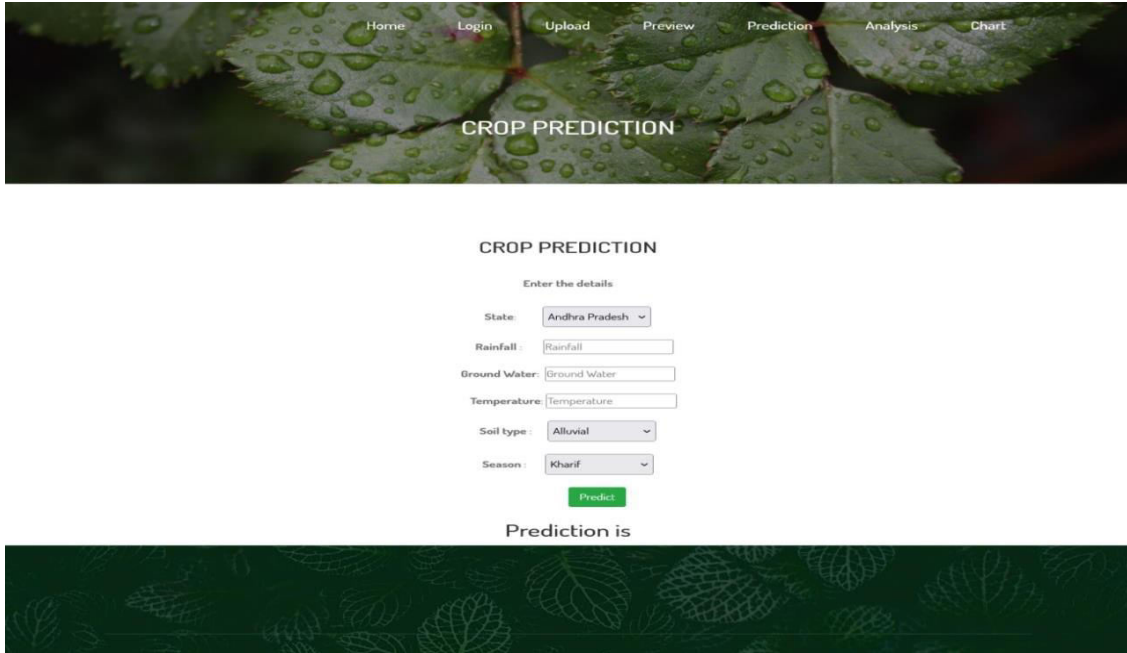
Snapshots:

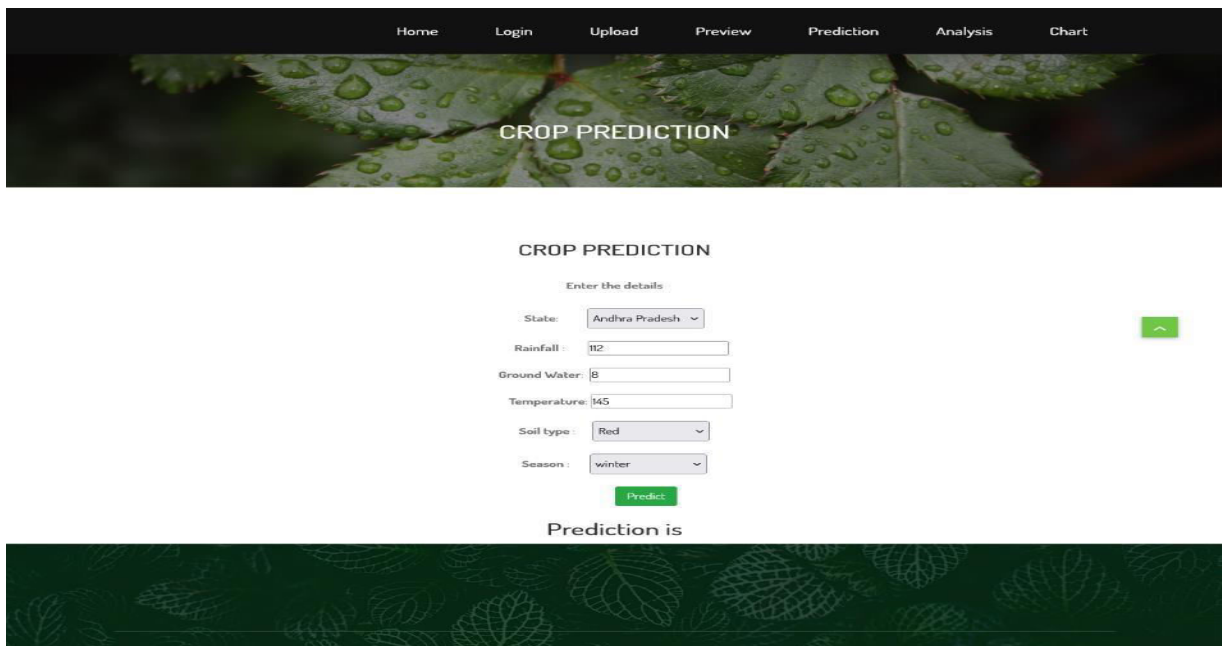**Figure 2: Crop prediction page**
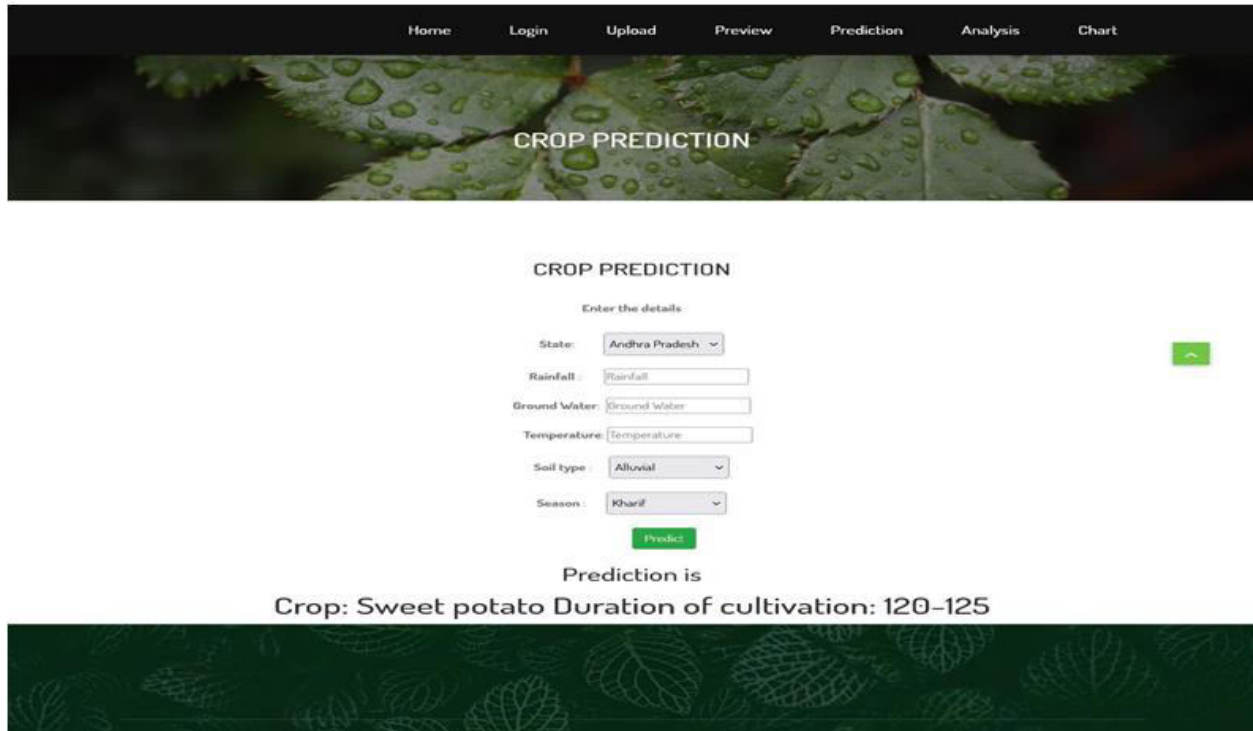

Figure 3: click to predict page

Figure 4 : The prediction is displayed

V. CONCLUSION

In this paper, significance of management of crops was studied vastly. Farmers need assistance with recent technology to grow their crops. Proper prediction of crops can be informed to agriculturists in time basis. Many Machine Learning techniques have been usedto analyze the agriculture parameters. Some of the techniques in different aspects of agriculture are studied by a literature study. Blooming Neural networks, Soft computing techniques plays significant part in providing recommendations. Considering the parameter like production and season, more personalized and relevant recommendations can be given tofarmers which makes them to yield good volume of production.

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