

# **DETECTION AND IDENTIFICATION OF CROP YIELD RECOMMENDER SYSTEM USING CLUSTERING ALGORITHMS**

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## **ABSTRACT**

Without a doubt, the most significant source of income in rural India is provided by agriculture and its affiliated industries. In addition, the agriculture industry makes a significant contribution to the nation's Gross Domestic Product (GDP). However, when compared to worldwide norms, the agricultural output per acre is unsatisfactory. This is one of the many potential reasons why marginal farmers in India commit suicide at higher rates. For farmers, this study suggests a practical and approachable yield prediction system. The suggested system offers farmers connectivity. GPS aids in locating the user. The user enters the inputs for the world and soil type. The most profitable crop list can be selected using machine learning algorithms, and they can also forecast the crop yield for a crop that the user has chosen. To predict the crop yield, selected Machine Learning algorithm the Random Forest which showed the most effective results with 95% accuracy. Additionally, the system also suggests the suitable time to use the fertilizers to boost up the yield.

## **I. INTRODUCTION**

### **1.1 PROBLEMDEFINITION**

The problem that the Indian Agriculture sector is facing is the integration of technology to bring the desired outputs. With the advent of new technologies and overuse of non-renewable energy resources patterns of rainfall and temperature are disturbed. The inconsistent trends developed from the side effects of global warming make it cumbersome for the farmers to clearly predict their crop yield .

### **1.2 PURPOSEOFTHEPROJECT:**

The purpose of the project is to help farmers to generate profits. A lot of work has to be done on the dataset for its analysis and prediction. This whole work is done so as to check the current position of crops and find out the future expected crop so that the framers can predict which cropyield is more.

### **1.3 SCOPE**

This Paper can be used by any farmer of who wants to grow or do farming.It can also be used by students and researchers for their work.

## **II.EXISTING SYSTEM**

The biggest challenge in agriculture is to increase farm production and offer it to the end-user with the best possible price and quality.It is also observed that at least 50% of the farm produce gets wasted, and it never reaches the end-user. One of the recent works, It has been shown that KNN clustering proved much better than SVM or regression. The existing system which recommends crop yield is either hardware-based being costly to maintain, or not easily accessible.

## **III. PROPOSED SYSTEM**

In this project, we have proposed a model that addresses the existing issues. The novelty of the proposed system is to guide the farmers to maximize the crop yield as well as suggest the most

profitable crop for the specific region.

The proposed model provides crop selection based on economic and environmental conditions, and benefit to maximize the crop yield that will subsequently help to meet the increasing demand for the country's food supplies. The proposed model predicts the crop yield by studying factors such as rainfall, temperature, area, season, soil type etc. The system also helps to determine the best time to use fertilizers.

The user provides an area under cultivation and soil type as inputs. According to the requirement, the model predicts the crop yield for a specific crop. The model also recommends the most profitable crop and suggests the right time to use the fertilizers.

### **3.1 METHOD USED**

#### **The Random Forests Algorithm**

Let's understand the algorithm in layman's terms. Suppose you want to go on a trip and you would like to travel to a place which you will enjoy.

So what do you do to find a place that you will like? You can search online, read reviews on travel blogs and portals, or you can also ask your friends.

Let's suppose you have decided to ask your friends, and talked with them about their past travel experience to various places. You will get some recommendations from every friend. Now you have to make a list of those recommended places. Then, you ask them to vote (or select one best place for the trip) from the list of recommended places you made. The place with the highest number of votes will be your final choice for the trip.

In the above decision process, there are two parts. First, asking your friends about their individual travel experience and getting one recommendation out of multiple places they have visited. This part is like using the decision tree algorithm. Here, each friend makes a selection of the places he or she has visited so far.

The second part, after collecting all the recommendations, is the voting procedure for selecting the best place in the list of recommendations. This whole process of getting recommendations from friends and voting on them to find the best place is known as the random forests algorithm.

#### **3.2 How does the algorithm work?**

It works in four steps:

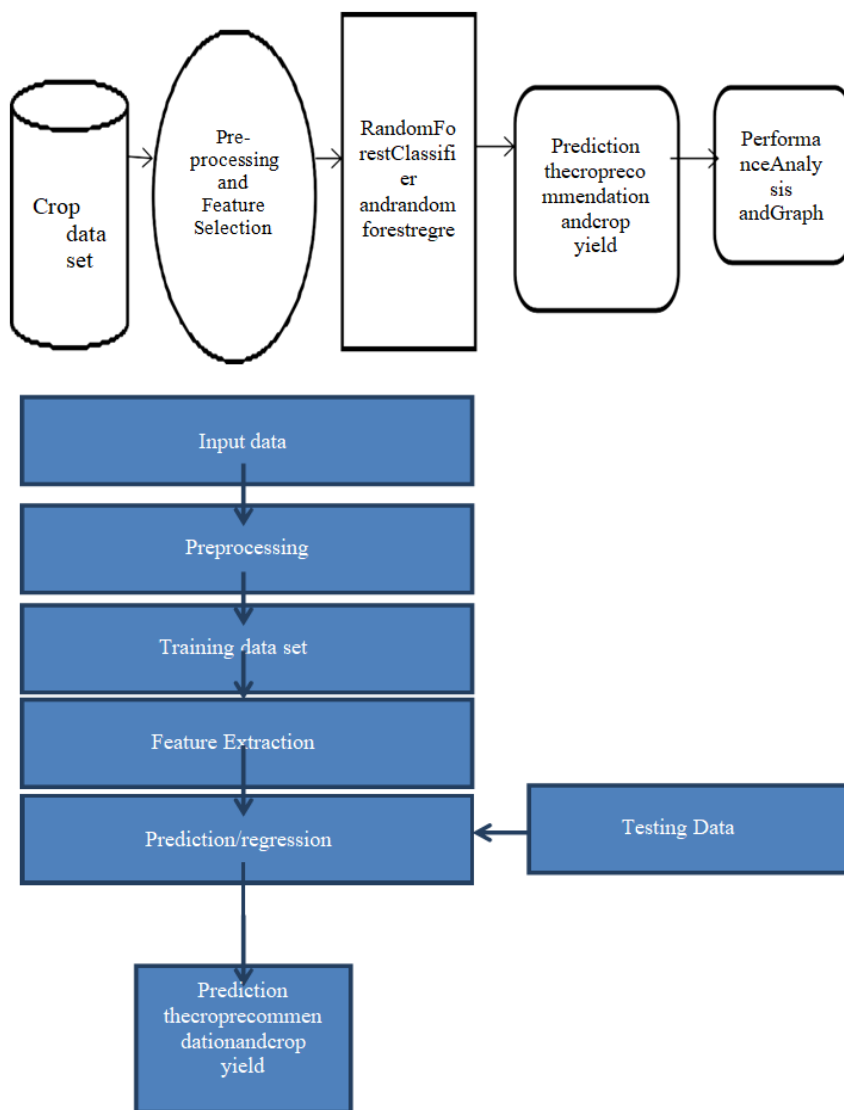
Select random samples from a given dataset.

Construct a decision tree for each sample and get a prediction result from each decision tree. Perform a vote for each predicted result.

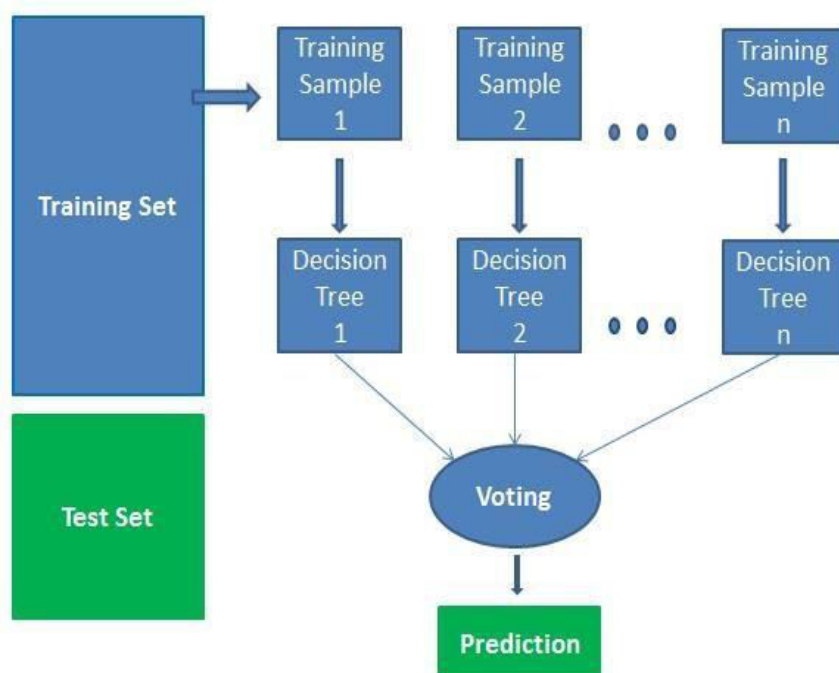
Select the prediction result with the most votes as the final prediction.

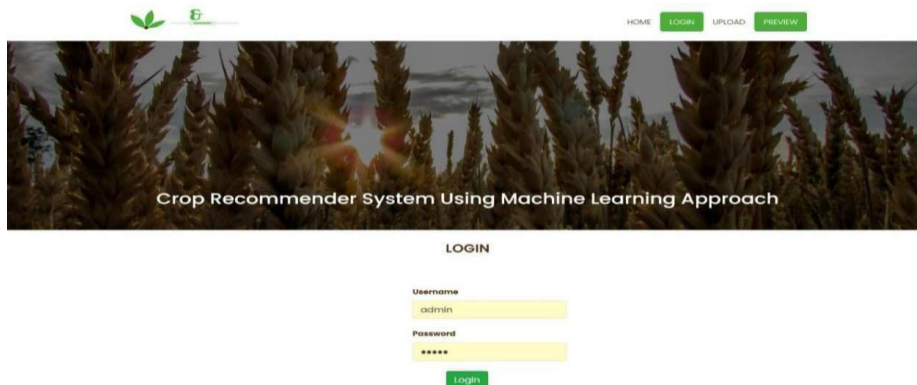
### **IV. MODEL ARCHITECTURE**

System architecture is the transformation of an analysis model into a system model. During system design, developers define the design goals of the project and decompose the system into smaller subsystems that can be realized by individual teams.



## V. IMPLEMENTATION AND RESULT





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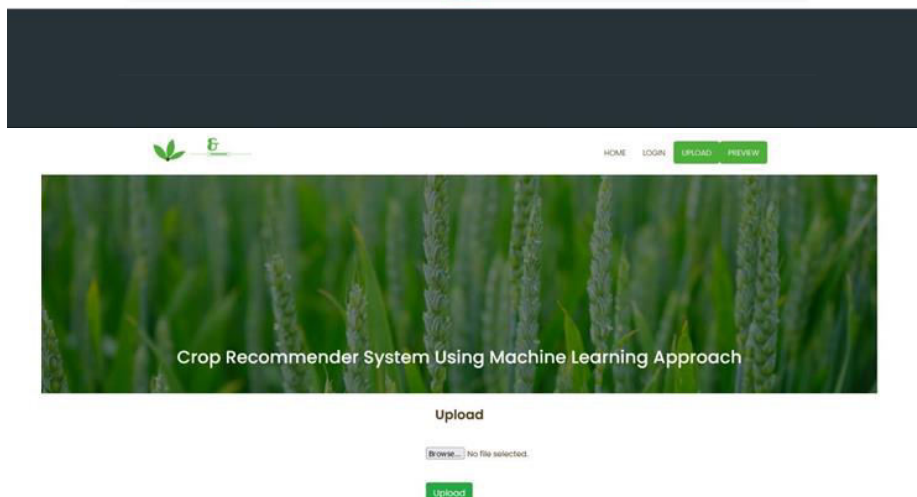
### Crop Recommender System Using Machine Learning Approach

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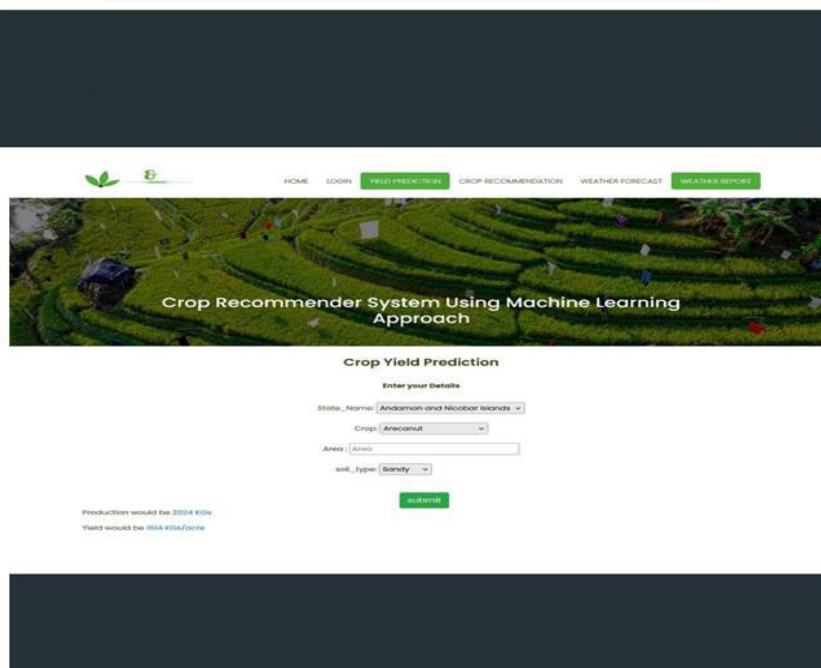
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### Crop Recommender System Using Machine Learning Approach

#### Crop Yield Prediction

Enter your Details

State\_Name Andaman and Nicobar Islands

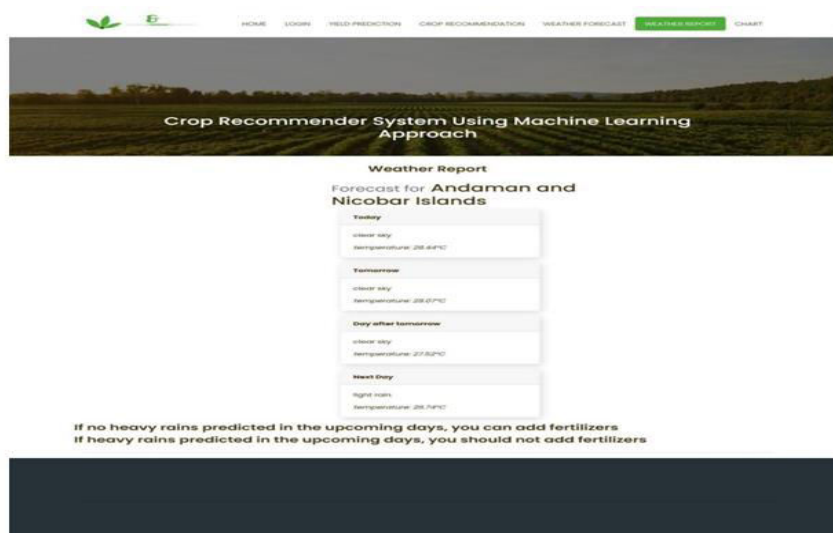
Crop Arecanut

Area Acres

soil\_type Sandy

submit

Production would be 2024 KDa  
Yield would be 1854 KGs/acre



## CONCLUSION

The limits of current technologies and their usefulness for yield prediction were emphasized in this paper. Then, a proposed method connects farmers by walking them through a workable yield prediction system. The built-in prediction technology aids farmers in forecasting crop yields. The built-in recommender system enables the user to investigate potential crops and their yield in order to make more informed judgments. Machine learning algorithms were put into practice and tested on the provided datasets for yield to accuracy. The suggested model also investigated when to apply fertilizers and suggested a suitable time frame.

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