

# Prediction of crop yeild

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**Abstract:** *Agriculture helps to meet the basic needs of human and their civilization by providing food, clothing, shelters, medicine and recreation. Hence, agriculture is the most important enterprise in the world. We proposed this system to make a little bit contribution in making Indian farming as technical farming using scientific methods in farming such as Internet of things and Machine Learning. This system will suggest the crop which is suitable for cultivation based on the geographic area and climatic conditions by using sensors. In this paper we predict the crop which is suitable for cultivation based on three parameters such as temperature, humidity and moisture. We use sensors to collect data. For prediction we use Random Forest and K-means algorithm and result will be seen on android application.*

**Keywords:** Climate, Sensors, crop production, prediction, Internet of Things, Machine Learning, Random Forest Algorithm, K-means.

## 1. INTRODUCTION

Agriculture Assist to the basic needs of people and their progress by providing food, shelters, medicine and recreation. Hence, It is the most vital enterprise in the world. It is a productive unit where the free gifts of nature namely land, air, temperature and rain water etc., are integrated into single basic unit essential for human beings. Secondary productive units namely animals including livestock, birds and insects, feed on these primary units and provide intensive products such as milk, wool, eggs, honey, silk and lac. Therefore the term agriculture means cultivation of land that is the science and art of producing crops and livestock for economic purposes. The aim of agriculture is to cause the land to produce more abundantly, and at the same time, to protect it from deterioration and misuse. It is also mention as the science of producing crops and livestock from the natural resources of the earth.

For increasing net produce, better planning and gaining more profit prediction in agriculture plays a major role. This system helps farmer to cultivate proper crop for better yield prediction. The system uses machine learning for prediction of crops. Machine Learning is category of algorithm that allows software application to become more accurate in predicting outcomes without being explicitly programmed. The basic premise of machine learning is to build algorithms that can receive input data and use statistical analysis to predict an output while updating output as new data becomes available.

We use sensors to collect data about temperature, moisture, humidity. Data will be stored on cloud by using arduino and wifi. By using Random forest and K-means algorithm we predict which crop is suitable for cultivation, and result will be seen on android application.

## II. LITRATURE SURVEY

Crop Selection Method Based on Various Environmental Factors Using Machine Learning. Nishit Jain, Amit Kumar, Sahil Garud, Vishal Pradhan, Prajakta Kulkarni.

we suggest a method which would help suggest the most suitable crop(s) which will maximize yield by summing up the analysis of all the affecting parameters. These affecting parameters can be economical, environmental as well as related to yield in nature. Economic factors such as market prices, demand etc. play a very significant role in deciding a crop(s) as does the environmental factors such as rainfall, temperature, soil type and its chemical composition and total produce. Therefore, it's necessary to design a system taking into consideration all the affecting parameters for the better selection of crop(s) which can be grown over the season.

Agricultural Production Output Prediction Using Supervised Machine Learning Techniques Md. Tahmid Shakoor, Karishma Rahman, Sumaiya Nasrin Rayta, Amitabha Chakrabarty.

The research suggests area based beneficial crop rank before the cultivation process. It indicates the crops that are cost effective for cultivation for a particular area of land. To achieve these results, we are considering six major crops which are Aus rice, Aman rice, Boro rice, Potato, Jute and Wheat. The prediction is based on analysing a static set of data using Supervised Machine Learning techniques. This static dataset contains previous years' data taken from the Yearbook of Agricultural Statistics and Bangladesh Agricultural Research Council of those crops according to the area. The research has an intent to use Decision Tree Learning- ID3 (Iterative Dichotomiser 3) and K-Nearest Neighbors Regression algorithms..

Machine learning approach for forecasting crop yield based on climatic parameters. S.Veenadhari, Dr. Bharat Misra, Dr.CD Singh

In the present study a software tool named 'Crop Advisor' has been developed as an user friendly web page for predicting the influence of climatic parameters on the crop yields. C4.5 algorithm is used to find out the most influencing climatic parameter on the crop yields of selected crops in selected districts of Madhya Pradesh. This software provides an indication of relative influence of different climatic parameters on the crop yield, other agro-input parameters responsible for crop yield are not considered in this tool, application of these input parameters varies with individual fields in space and time.

A Scalable Machine Learning System for Pre-Season Agriculture Yield Forecast Igor Oliveira, Renato L. F. Cunha, Bruno Silva, Marco A. S. Netto.

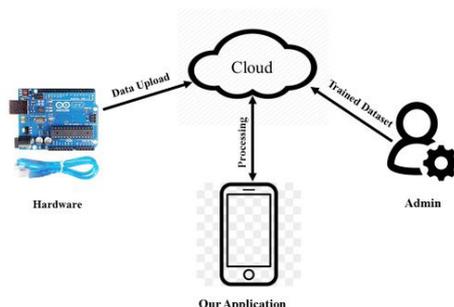
Yield forecast is essential to agriculture stakeholders and can be obtained with the use of machine learning models and data coming from multiple sources. Most solutions for yield forecast rely on NDVI (Normalized Difference Vegetation Index) data, which is time-consuming to be acquired and processed. This system provides significantly useful results by the exempting the need for high-resolution remote-sensing data and allowing farmers to prepare for adverse climate influence on the crop cycle. In our studies, we forecast the soybean and maize yields for Brazil and USA, which corresponded to 44% of the world's grain production in 2016. Results show the error metrics for soybean and maize yield forecasts are comparable to similar systems that only provide yield forecast information in the first weeks to months of the crop cycle.

### III. PROPOSE SYSTEM

In this paper using sensor it will fetch the information and we store this information on cloud. Analyse this information and predict the suitable crop for cultivation. Result will be shown on android application and also we can see the information related to crop.

### IV. SYSTEM ARCHITECTURE

Following diagram is our system's architecture diagram:



**Figure 1:** system architecture

Sensor connection:-We use Temperature, humidity and moisture sensors to collect data.

Controller connection: - Arduino can transmit the value using Wi-Fi to cloud.

Creating Dataset:- Dataset will be store on cloud and it contain value of temperature, humidity and moisture.

Analysis:- We use Random Forest and K-means algorithm for prediction.

Android Application:- We show the result on android application. Which shows the predicted value of crop and other related information of crop.

### V. OBJECTIVE

To help user to gain knowledge about agriculture.

To help farmer to get information about crop disease.

To predict a crop so that it produces maximum yield with maximum benefit.

### VI. MODULE

Software Modules:

1. Registration:-User get registered with system

2. Login:-After registration user can login and access system.

3. Dataset Generation:-Required dataset is generated

4. Wi-Fi Interfacing:-Wi-fi interfacing is done.

5. Fetch Values from H/W:-Values are fetched using hardware

6. Analysis of H/W values

7. Result display

Hardware Modules:

1. Sensor connection

2. Controller connection

3. Wi-Fi Connection

### VII. CONCLUSION

Since the yield of farm highly depends on the crop selected for cultivation and environmental parameters

Therefore proper selection of crop before cultivation is important in farming. This system can be a great help in deciding the proper crop as per the given climatic conditions which will help to maximize yield rate.

We are implementing a decision support system for monitoring different farm activities. Using Monitoring information farmer can access or control his farm activities.

It helps to increase a Crop yield and contain crop information and disease related to crop. Our system is cost effective and user friendly.

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