CROP PRODUCTION PREDICTION

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Abstract: Agriculture is the backbone of India as 50% of population in India depends on it, still it is one of the least paid occupations of India. Recent development in Information technology for agriculture field has become interesting research area.

Machine learning can play a significant role in Agriculture field by increasing the crop yield production rate. Various regression algorithms can be used for predicting crop production. The aim is to develop extremely effective model for prediction of crop production with most minimal computational difficulties. By using machine learning algorithms, relative errors can be reduced which are caused by factors like weather parameters, area, pesticides, rainfall etc. The model can help farmers to know crop production in advance to plan and choose a crop that would give a better yield.

(*Keywords*: Agriculture, Crop production, Machine learning)

1. Introduction

Since it is essential to both human and animal survival in India, agriculture is the foundation of the country's economy. The need for agricultural products will skyrocket as the world population, which was estimated at 1.8 billion in 2009, is expected to reach 4.9 billion by 2030. The need for agricultural products will increase as the world's population grows, necessitating effective farmland development and an increase in crop output. Meanwhile, crops were regularly ruined by unfavorable weather conditions as a result of global warming. Farmers are destroyed by even a single crop failure brought on by poor soil fertility, weather changes, floods, poor soil fertility, poor groundwater availability, and other similar problems. According to the geography of the area and environmental conditions, the society in other countries recommends farmers to boost the production of particular crops. The estimation and monitoring of crop production are required since the population has been growing at a much faster rate. As a result, a suitable strategy must be developed by taking the influencing factors into account for the better selection of crops with respect to seasonal variance. The primary goal of crop yield estimation is to boost agricultural crop production, and numerous proven models are utilized to do so. Forecasting, flaw detection, pattern recognition, etc. are already common industries. When there is a loss due to unfavorable conditions, the ML algorithms also assist in

increasing the crop yield production rate. Regardless of the distracting environment, ML algorithms are used for the crop selection approach to reduce yield production losses. ML techniques were used to improve precision and selection stability. ML offers a number of efficient techniques that are used to identify the relationship between input and result in yield and crop prediction. For example, smart irrigation systems, crop disease prediction, crop selection, weather forecasting, and determining the minimal support price are all examples of machine techniques used in agriculture. These methods will increase field productivity while requiring less work from farmers in terms of input. Additionally, because they made use of enormous amounts of data and played a crucial part, the advancements in machines and technologies were accurate. This study examines the advantages and disadvantages of the various ML-based agriculture techniques.

2.Related Work

A paper survey is a crucial research step. Making a survey of earlier papers enables us to gain a deeper understanding of the subject and the level of advancement made in that particular area. These surveys can help us with our study and provide us with a fundamental understanding of the development process.

Random Forests for Global and Regional Crop Yield Predictions.

This article was produced by the Institute on the Environment at the University of Minnesota in St. Paul, Minnesota, 55108, in the United States. The k-nearest neighbors algorithm, Support Vector Regression, and Random Forest algorithms were employed in this study. As a result, RF is most efficient.

Applications of Machine Learning Techniques in Agriculture Crop Production.

In October 2016, the Indian Journal of Science and Technology published Volume 9(38), DOI:10.17485/ijst/2016/v9i38/95032. An enhanced indistinct cluster analysis is utilized to categories regions of interest in plants, soil, and detritus using a color image taken using GPS.

Crop Production Ensemble Machine Learning Model for

Prediction.

The IJCSSE is the international journal of computer science and software engineering. AdaNaive and AdaSVM are the ensemble models that are suggested in this paper for use in projecting crop production over a time frame.

Machine learning approach for forecasting crop yield based on parameters of climate.

This research was presented at the International Conference on Computer Communication and Informatics (ICCCI).In recent research, a user-friendly website called Crop Advisor, a software programme with the name Crop Advisor, was created for forecasting the impact of climate variables on crop output.

Analysis of Crop Yield Prediction by making Use Data Mining Methods.

International Journal of Research in Engineering and Technology: The article that was published there. To maximise the productivity of different crops, the major goal is to develop a user-friendly interface for farmers that provides an analysis of rice production based on the available data.

3. Conclusion

The various characteristics that are primarily based on the availability of data were described in the current study effort. Each research will examine CYP utilizing ML algorithms that are distinct from the features. The features were picked based on the geological position, scale, and crop features, and these decisions were largely influenced by the availability of the data-set. However, using more features did not necessarily result in better outcomes. As a result, it was decided to test only the few aspects that performed best and were also used in the studies.

The current study demonstrated the possible use of data mining techniques in crop yield prediction based on the input characteristics of the climatic conditions. The generated webpage is user-friendly and all of the crops and research districts with predictions accuracy above 75% indicate higher prediction accuracy. The user-friendly website designed for crop yield prediction can be utilized by any user with their preferred crop by giving climate data for that location.

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