

ESTIMATE THE CROP YIELDS USING DATA ANALYTICS

ABSTRACT :

Agriculture is important for human survival because it serves the basic need. A well-known fact that the majority of population ($\geq 55\%$) in India is into agriculture. Due to variations in climatic conditions, there exist bottlenecks for increasing the crop production in India. It has become a challenging task to achieve desired targets in Agri based crop yield. Various factors are to be considered which have direct impact on the production, productivity of the crops. Crop yield prediction is one of the important factors in agriculture practices. Farmers need information regarding crop yield before sowing seeds in their fields to achieve enhanced crop yield. The use of technology in agriculture has increased in recent year and data analytics is one such trend that has penetrated into the agriculture field. The main challenge in using big data in agriculture is identification of effectiveness of big data analytics. Efforts are going on to understand how big data analytics can agriculture productivity. The present study gives insights on various data analytics methods applied to crop yield prediction and also signifies the important lacunae points' in the proposed area of research.

INTRODUCTION :

Agriculture forms the basis for food security and hence it is important. In India, majority of the population i.e., above 55% is dependent on agriculture as per the recent information. Agriculture is the field that enables the farmers to grow ideal crops in accordance with the environmental balance. In India, wheat and rice are the major grown crops along with sugarcane, potatoes, oil seeds etc. Farmers also grow non-food items like rubber, cotton, jute etc. More than 70% of the household in the rural area depend on agriculture. Hunger is one of the most devastating issues in the world and increasing crop yield production is a feasible solution to overcome this problem. In the farm output, India ranks second considering the world wide scenario. This is the widest economic sector and has an important role regarding the framework of socio-economic fabric of India. Farming depends on various factors like climate and economic factors like temperature, irrigation, cultivation, soil, rain fall, pesticide and fertilizers.

LITERATURE REVIEW :

[1] - The author prepare a method which helps us predict crop yield by suggesting the best crops. It also focus on soil types in order to identity which crop should be planted in the filed to increase productivity. In terms of crop yield, soil information can be obtained .

Advantage :

It allows us to predict which crops would be opportunity for a given climate. Using the weather and disease related data sets the crop quality can also be improved prediction algorithms help us to classify the data based on the disease and data extracted from the classifier is used to predict soil and crop.

Disadvantage :

Due to the changing climatic conditions accurate results cannot be predicted by this system.

[2] - Agriculture sector is struggling to increase the productivity of crop in India. Monsoon rainfall is the main source of water for more than 60 percent of the crops. Smart agriculture driven by Information Technology is the emerging trend in the research in this area in recent days. One of the areas being explored is the problem of yield prediction which is a major concern.

Advantage :

1. The main source of water for agriculture is given by the monsoon forest . information technology is the emerging trend .

Disadvantage :

1. Agriculture sector is struggling to increase the crop production and some of the areas being explored the problem of yield prediction is a major concern.

[3] – This system will provide a complete technical solution using the internet of things to the farmers to prevent their crops from wild animals and provide information to the farmers to prevent their crops from wild animals and provide information to the farmers to maximize their production.

Advantage :

1. Suitable for large scale growers

Disadvantage :

1. Initial building costs high

[4] - Data mining is the process in which the hidden patterns are discovered using analysis of large data sets. The data mining and data analytics techniques use artificial intelligence, statistics, machine learning and database system. In data mining, unsupervised and supervised methods are being used. In unsupervised learning, clusters are formed using large data sets and in supervised learning classification

are done based on the data sets. In clustering technique, 'data points' are examined to group them into 'clusters' according to specific parameter. The data points in same cluster have less distance compared to data points of different clusters.

Advantage :

1. Data analytics use artificial intelligence , statistics, machine learning and database system . unsupervised and supervised methods are being used .

Disadvantage :

1. This process of data types are some times didn't predict correctly for some reasons .

[5] - At present we are at the immense need of another Green revolution to supply the food demand of growing population. With the decrease of available cultivable land globally and the decreased cultivable water resources, it is almost impossible to report higher crop yield. Agricultural based big data analytics is one approach, believed to have a significant role and positive impact on the increase of crop yield by providing the optimum condition for the plant growth and decreasing the yield gaps and the crop damage and wastage .

Advantage :

1. Agriculture based big data analytics is one approach, believed to have a significant role and positive impact .

Disadvantage :

1. In this time we are having small amount of food crops in the demand of growing population.
2. The plant growth are decreasing the yield gaps and the crop damage and wastage.

[6] - Soil profile descriptions were proposed by the researcher for classifying soils in combination with GPS based technologies. They were applied K-Means approach for the soil classification. In a similar approach, crop classifications using hyper spectral data was carried out by adopting one of the data mining approach i.e. Support Vector Machines.

Advantage :

1. The soils well prepare for the yield crops classifying soils in combination with GPS based technologies.

Disadvantage :

1. Due to the changing climatic conditions accurate results cannot be predicted by this system.

[7] - It is also one of the country which suffer from major natural calamities like drought or flood which damages the crop which cause huge financial loss for the farmers and economic stability of the country. Predicting the crop yield well in advance prior to its harvest can help the farmers and Government organizations to make appropriate planning like storing, selling, fixing minimum support price, importing/exporting etc.

Advantage :

1. Government organization to make appropriate planning like strong , selling , fixing minimum support price .

Disadvantage :

1. Country suffer from major natural calamities like drought or flood which damage the crop which cause huge financial loss .

[8] - Predicting a crop well in advance requires a systematic study of huge data coming from various variables like soil quality, pH, essential elements (N,P,K) quantity etc. As Prediction of crop deals with large set of database thus making this prediction system a perfect candidate for application of data mining methodologies which majorly helps in acquiring a knowledge to achieve higher crop yield.

Advantage :

1. Advance require a systematic study of huge data coming various variables like soil quality.

Disadvantage :

1. This data prediction is fails some times of reason .

REFERENCE :

1. R.Neela , P. Fertilizers recommendation system for Disease prediction in Tree Leaves International Journal of scientific & technology research volume issue 11,November 2019 .
2. M J Foulkes, “Raising Yield Potential of Wheat”, Journal of Experimental Botany, vol. 62, 2011.
3. B M Sagar, Cauvery N K Department of Information Science & Engg, R V College of Engineering, 3, December 2018 .
4. Jharna Majumdar, Sneha Naraseeyappa, Shilpa Ankalaki. Analysis of agriculture data using datamining techniques: application of big data. Journal of Big data. 2017.
5. D Ramesh, B Vishnu Vardhan. Data Mining Techniques and Applications to Agricultural Yield Data. International Journal of Advanced Research in Computer and Communication Engineering. 2013.
6. R V Martin, "Seasonal Maize Forecasting for South Africa and Zimbabwe Derived From an Agroclimatological Model", Journal of Applicable Meteorology, vol. 39, 2000.
7. F K Van Evert, S Fountas, D Jakovetic, V Crnojevic, I Travlos, C Kempenaar. Big Data for weed control and crop protection. John Wiley & Sons Ltd on behalf of European Weed Research Society, 2017.
8. Swarupa Rani. The Impact of Data Analytics in Crop Management based on Weather Conditions. International Journal of Engineering Technology Science and Research. 2017.