LITERATURE SURVEY

on

CROP YIELD ESTIMATION USING DATA ANALYTICS.

by

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[1] LITERATURE

ABSTRACT

Agriculture is important for human survival because it serves the basic need. It has become 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.

ADVANTAGE

The precise quantification of the rice productivity in various climatic conditions can help farmer to understand the optimum condition for the higher rice crop yield. Risks can be measured when suitable mathematical and statistical model designs are applied on data related to soil, weather and past yield.

DISADVANTAGE

One important disadvantage of this strategy is that crop areas cannot be aggregated at farm or higher levels, since intercropped fields would be double counted. The main disadvantage of this strategy is that is does not allow for assessing the impact of intercropping on crop yields.

[2] LITERATURE

ABSTRACT

Optimization of agricultural practices for enhanced crop yield is considered to be essential phenomena for the countries like India. In order to strengthen the economy and also to meet the food demand for the exponentially growing population, optimizing the agricultural practices has become necessity. In India, weather and geographical conditions are highly variable and were thought to be the major bottleneck of agricultural practices to achieve improved crop yield. Agricultural practices in India are facing many challenges such as change in climatic conditions, different geographical environment, conventional agricultural practices; economic and political scenario.

ADVANTAGE

A strong advantage of the crop-cut method is that the area of the cut is known and thus does not introduce an error into the final yield computation.

DISADVANTAGE

The type of local harvest unit and their average weight may vary considerably between regions, years, and even farmers. Farmers may systematically over- or underreport production data in case of suspected benefits, such as food aid or a free input program, or penalties, such as taxes.

[3] LITERATURE

ABSTRACT

The agriculture sector in India is facing a tough problem to increase crop productivity. More than 60 per cent of the crop still depends on rainfall. Crop yield depends on many factors including soil, climate, rainfall, fertilizers and pesticides. Many factors have different effects on agriculture. Recent developments in information technology for agriculture have become an interesting research area for assessing crop yields. The yield estimation problem is a major problem that needs to be addressed based on available data. it is possible for farmers and government agencies to gain information or knowledge that will help them make better decisions and make decisions that lead to production. The proposed approach is to give farmers instructions on other crops that are suitable for their land conditions in the area. Various data mining techniques can be used and evaluated in agriculture to predict future crop production. Various classification algorithms are applied to assess soil fertility. This paper focuses on the classification of soil fertility rate using K-Means and Random Tree.

ADVANTAGE

This helps the farmers to select a particular crop for the seeds depending on the weather conditions and provides the information needed to choose the best climate for doing quality farming.

DISADVANTAGE

The apriori algorithm uses the downward closure property, i.e., all the subsets of a frequent itemset are frequent, but the converse may not be true.

[4] LITERATURE

ABSTRACT

Agriculture plays an important role in agriculturally based counties like India, where it contributes more to growth of India's GDP. One of the major works in agriculture is foretelling of crop yield. The unpredictable weather in environment which puts the farmer into a risk. So, this necessity the proper historical data, which can be reserved. Those stored data can be examined in order to foretell the yield in agriculture. For this purpose, there is a need of advanced technologies in every facet of agriculture. In order to choose such a crop which suits best for that area and foretell yield. Data mining technique with advanced form can be introduced. Raspberry PI, Soil moisture, Temperature, Humidity and rain sensors utilized in order to achieve this. Thus, by using Multiple Linear Regression technique we can divine the crop production.

ADVANTAGE

Software and technical knowledge are not known to everyone. So, to such farmers, automated and simple way usable system needs to be developed.

DISADVANTAGE

Software and technical knowledge are not known to everyone. So, to such farmers, automated and simple way usable system needs to be developed. This strategy is not cheap and inexpensive. Limitation of the study is that small sample sizes were used for estimation of crop area and yield. Further, the data collection period was too short which created difficulties.

[5] LITERATURE

ABSTRACT

The main challenge using big data in agriculture is identification of impact and effectiveness of big data analytics. Efforts are going on to understand how big data analytics can be used to improve the productivity in agricultural practices. The analysis of data related to agriculture helps in crop yield prediction, crop health monitoring and other such related activities. In literature, there exist several studies related to the use of data analytics in the agriculture domain. The present study gives insights on various data analytics methods applied to crop yield prediction. The work also signifies the important lacunae points in the proposed area of research.

ADVANTAGE

Agriculturally based 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.

DISADVANTAGE

The existence of missing values and outliers, along with the arbitrary process of removing measurements from field areas with no adequate plant density, are the most important issues.

[6] LITERATURE

ABSTRACT

Crop yield is affected by various soil and environmental parameters and can vary significantly. Therefore, a crop yield estimation model which can predict pre-harvest yield is required for food security. The study is conducted on tea forms operating under National Tea Research Institute, Pakistan. The data is recorded on monthly basis for ten years period. The parameters collected are minimum and maximum temperature, humidity, rainfall, PH level of the soil, usage of pesticide and labor expertise. The design of model incorporated all of these parameters and identified the parameters which are most crucial for yield predictions. Feature transformation is performed to obtain better performing model. The designed model is based on an ensemble of neural networks and provided an R-squared of 0.9461 and RMSE of 0.1204 indicating the usability of the proposed model in yield forecasting based on surface and environmental parameters.

ADVANTAGE

Feature transformation sometime help in improvement of model performance. One purpose of using feature transformation is to compress the dynamic range of data which is useful in many algorithms. Feature scaling can reduce the time to find support vectors and affect the results as well.

DISADVANTAGE

The dataset under use is not used for yield forecasting in past and need a baseline performance. Non-linearity of parameters may lead to poor performance.

[7] LITERATURE

ABSTRACT

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 being used for management of crop yield and monitoring crop health. The recent trends in the domain of agriculture have made the people to understand the significance of data. The main challenge using big data in agriculture is identification of impact and effectiveness of big data analytics. Efforts are going on to understand how big data analytics can be used to improve the productivity in agricultural practices. The analysis of data related to agriculture helps in crop yield prediction, crop health monitoring and other such related activities. In literature, there exist several studies related to the use of data analytics in the agriculture domain. The present study gives insights on various data analytics methods applied to crop yield prediction. The work also signifies the important lacunae points in the proposed area of research.

ADVANTAGE

An approach involving rerunning the algorithm to the point of highest loglikelihood instead of using the estimate from the maximum allowable iteration appeared to further improve estimation efficiency.

DISADVANTAGE

Ratio estimation does not make use of data from any county other than the one being estimated. Thus an estimate for a given county cannot be generated in the absence of survey records for that county.

[8] LITERATURE

ABSTRACT

County level estimates of various agricultural commodities published by USDA's National Agricultural Statistics Service (NASS) are in heavy demand by users in government, the private sector and the academic community. In particular, accurate small area estimation of crop yields has become increasingly important over recent years. While NASS has traditionally used ratio estimation to derive yield numbers, model-based methods that make efficient use of available data sources hold the promise of significant improvement over the standard approach.

ADVANTAGE

Estimates produced by the SG algorithm can improve upon ratio estimation even in cases where convergence does not occur within the maximum allowable number of iterations.

DISADVANTAGE

The program cannot run if one or more of the size groups contain no positive QAS records for the crop of interest.

REFERENCE

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