

# **Estimate the crop yield using data analytics**

## **Literature survey**

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### **Introduction:**

Agriculture proves to be a major factor of Indian economy and it involves production of crops. Crops may be either food crops or commercial crops. Food crops include paddy, wheat, maize, grams, millets, etc., whereas commercial crops are sugarcane cotton, groundnut, cashew, etc. The productivity of the crops is significantly influenced by weather conditions. Hence, accurate yield prediction is a major problem that ought to be addressed. Early prediction of yield would facilitate the farmers to make precautionary actions to improve productivity. Early prediction is possible through collection of previous experience of the farmers, weather conditions and other influencing factors and; store it in a large database. The common input parameters are rainfall, temperature, humidity, solar radiation, crop population density, fertilizer application and irrigation, type of soil, depth, farm capacity, and soil organic matter. By

applying data mining techniques such as prediction, classification and clustering, early decisions are possible. Estimating agricultural yield prior to harvest is an important issue in agriculture, as the changes in crop yield from year to year influence international business, food supply, and global market prices. Also, early prediction of crop yield provides useful information to policy planners. Appropriate prediction of crop productivity is required for efficient planning of land usage and economic policy. In recent times, forecasting of crop productivity at the within-field level has increased. The most influencing factor for crop productivity is weather conditions. If the weather based prediction is made more precise, then farmers can be alerted well in advance so that the major loss can be mitigated and would be helpful for economic growth. The prediction will also aid the farmers to make decisions such as the choice of alternative crops or to discard a crop at an early stage in case of critical situations. Further, predicting crop yield can facilitate the farmers to have a better vision on cultivation of seasonal crop and its scheduling.

## **Crop Yield prediction using Data Analytics:**

Nowadays, 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. With this aim the present paper reviews about the various advances, design models, software tools and algorithms applied in the prediction assessment and estimation of the crop yield.

India is basically agriculture based country and approximately 70% our country economics is directly or indirectly related to the agricultural crops. The principle crop which occupies the highest (60-70%) percentage of cultivable land in the Indian soil is the paddy culture and

it is the major crop especially in central and south parts of the India. The enhanced yield of the rice crop depends largely on the water availability and climatic conditions. For example, low precipitation or temperature extremes can drastically diminish rice yield. Growing better strategies to foresee yield efficiency in a mixture of climatic conditions can help to understand the role of different principle factors that influence the rice crop yield.

### **PREDICTION :**

India is basically agriculture based country and approximately 70% our country economics is directly or indirectly related to the agricultural crops. The principle crop which occupies the highest (60-70%) percentage of cultivable land in the Indian soil is the paddy culture and it is the major crop especially in central and south parts of the India. Rice crop cultivation plays an imperative part in sustenance security of India, contributing over 40% to general yield generation.

## **Literature Review :**

**Methodology :** Satellite data have repeatedly been shown to provide information that, by themselves or in combination with other data and models, can accurately measure crop yields gap in farmers' fields.

**LIMITATIONS :** Design, development, investment and insurance of satellite requires higher cost. They are often less accurate than field-based measures. Satellite Internet latency can be a significant problem. Unlike terrestrial communications, minor changes in weather can have a massive impact on both the speed and latency of satellite data. Image processing is a time taking process.

Algorithm used: Agronomy.

[5] M. Paul, S. K. Vishwakarma and A. Verma, "Analysis of Soil Behaviour and Prediction of Crop Yield Using Data Mining Approach," 2015 International Conference on Computational Intelligence and

Communication Networks (CICN), 2015, pp. 766-771, doi:  
10.1109/CICN.2015.156.

**Methodology :** This work presents a system, which uses data mining techniques in order to predict the category of the analyzed soil datasets. The category, thus predicted will indicate the yielding of crops.

**LIMITATIONS :** The soil properties suitable for crop yield are considered. Climatic properties that affect the crops are not considered. For crop analysis, we need to monitor various environmental parameters such as temperature, humidity and moisture. Algorithm used: Naive Bayes and K-Nearest Neighbour (KNN)