IBM NAALAIYATHIRAN PROJECT

TECHNOLOGY : DATA ANALYTICS

DOMAIN : RURAL & AGRICULTURE DEVELOPMENT

TITLE : ESTIMATE THE CROP YIELD USING DATA ANALYTIC

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ABSTRACT :

        Agriculture is important for human survival because it serves the basic need.
A well-known fact that the majority of population (≥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 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. This domain provides employment to more than 60% of the total population and

has a contribution to GDP also (about 17%) [1]. 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.

Historical information regarding crop yield provides major input for companies engaged in this

domain. These companies make use of agriculture products as raw materials, animal feed, paper production and so on. The estimation of production of crop helps these companies in planning supply chain decision like production scheduling. The industries such as fertilizers, seed, agrochemicals and agricultural machinery plan production and activities like marketing based on the estimates of crop yield. Farmers experience was the only way for prediction of crop yield in the past days. Technology penetration into agriculture field has led to automation of the activities like yield estimation, crop health monitoring etc. Crop yield prediction has generated a lot interest in the research community.

COMPONENTS OF CROP YIELD PREDICTION:

Crop Management
This category involves studies concerning:
a) Yield Prediction, b) Disease Detection, c) Weed Detection, d) Crop Recognition, and e) Crop Quality

Water Management
This category is associated with the optimal use of water resources

Soil Management
This category is related to soil protection and soil management aspects

Livestock Management
This category includes the management pertaining to: a) Animal Welfare and b) Livestock Production

CHALLENGES IN CROP YIELD PREDICTION:

Crop Predictions are important for governments, farmers, and traders – a more accurate prediction of future supply allows for better policies, better profits, and better pricing. The concept of using satellites to predict crop yield is very simple: Take a picture of a field, look at the crops growing, measure the area of the field and predict the yield. However, there are substantial challenges to this, including:

•Scale – global
•Size – small farm to large agri-business
•Color – it's all green
•Phenology – Identification of relevant crops
•Area v Yield – Giving the area does not give the yield.
• Clouds

CONCLUSION:

As a result of penetration of technology into agriculture field, there is a marginal improvement in the productivity. The innovations have led to new concepts like digital agriculture, smart farming, precision agriculture etc. In the literature, it has been observed that analysis has been done on agriculture soils, hidden patterns discovery using data set related to climatic conditions and crop yields data. The activities of agriculture field are numerous like weather forecasting, soil quality assessment, seeds selection, crop yield prediction etc. In this survey, the specific activity, crop yield prediction has been surveyed and the major trends have been identified. It can be concluded that the research in the field of agriculture with reference to using IT trends like

data analytics is in its infancy. As the food is the basic need of humans, the requirement of getting the maximum yields using optimal resource will become the necessity in near future as a result of growing

population. The survey outcomes indicate the need for improved techniques in crop yield analytics.

There exists a lot of research scope in this research area.