ESTIMSTE THE CROP YEILD USING DATA ANALITICS

LITERATURE SURVEY

INTRODUCTION :

Crop yield prediction is one of the challenging tasks in agriculture. It plays an essential role in decision making at global, regional, and field levels. The prediction of crop yield is based on soil, meteorological, environmental, and crop parameters. Crop prediction attributes are defined by multiple factors such as genotype, climate and the interactions between the two. Accurate crop prediction needs a fundamental understanding of the functional relationship between cultivation and interactive factors like the genotype and climate.

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 :

[1] M. A. Jayaram and Netra Marad, “Fuzzy interference Systems for Crop Prediction”, Journal of Intelligent Systems, 2012, 21(4), pp.363-3720.6.

Methodology : It uses new methods to solve everyday problems. It is understandable and straightforward. Fuzzy logic is also extensively used today. The results are acceptable, it can be used with confidence, especially if we are dealing with inaccurate inputs.

LIMITATIONS : Human knowledge is often incomplete and episodic as compared to systematic way. If the model is not known then it is impossible to achieve the stability of the controller system. Sometime rules are mismatched and non coherent.

[2] P. Vindya “Agricultural Analysis for Next Generation High Tech Farming in Data Mining” , Anna University, Trichy, Tamilnadu, India, 5 May 2015.

Methodology : The purpose is to estimate difference in efficiency and prediction between organic and inorganic farming. This work achieves a high accuracy and a high generality in terms of yield prediction capabilities.

LIMITATIONS : It includes high costs of maintenance. The majority of farmers are illiterate, and understanding how to use current technologies in farming is difficult. Production cost in organic farming is quite higher.

Algorithm used: Genetic Algorithm, Artificial Neural Network (ANN), Nearest neighbor, Memory based reasoning.

[3] Dakshayini Patil, M .S, Shirdhonkar. Rice Crop Yield Prediction using Data Mining Techniques: An Overview. International Journal of Advanced Research in Computer Science and Software Engineering, 2017; 7(5):427-43. Methodology : It predicts the yield of rice crops and helps in growing better strategies at various climatic conditions.

LIMITATIONS : This research has the ability to only detect the yield of rice crops and it doesn’t detect any other crops. So, it is not effective.

Algorithm used: WEKA tool.

[4] David B. Lobell, The use of satellite data for crop yield gap analysis, Field Crops Research-143, 2013; 56–64.

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)

References :

1. Apolo-Apolo OE, Martínez-Guanter J, Egea G, Raja P, PérezRuiz M. 2020. Deep learning techniques for estimation of the yield and size of citrus fruits using a UAV. European Journal of Agronomy.

doi:https://doi.org/10.1016/j.eja.2020.126030. [Crossref], [PubMed], [Web of Science ®], [Google Scholar]

2. Apolo-Apolo OE, Pérez-Ruiz M, Martínez-Guanter J, Valente J. 2020. A cloudbased environment for generating yield estimation maps from apple orchards using UAV imagery and a deep learning technique. Frontiers in Plant Science.

doi:https://doi.org/10.3389/fpls.2020.01086. [Crossref], [PubMed], [Web of Science ®], [Google Scholar]

3. Chlingaryan A, Sukkarieh S, Whelan B. 2018. Machine learning approaches for crop yield prediction and nitrogen status estimation in precision agriculture: A review. Computers and Electronics in Agriculture. 151:61–69.

doi:https://doi.org/10.1016/j.compag.2018.05.012. [Crossref], [Web of Science ®], [Google Scholar]

4. Dharani M, Thamilselvan R, Natesan P, Kalaivaani P, Santhoshkumar S. 2021. Review on crop prediction using deep learning techniques. Paper presented at the Journal of Physics: Conference Series. [Crossref], [Google Scholar]

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