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FIELD CONDITION MANAGEMENT

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ABSTRACT: In emerging countries such as India and other countries, agriculture is an important factor. Computer engineering can help farmers improve agricultural production and soil quality. Learning techniques classifiers are essential for decision-making on plant diseases and soil issues. In this research, we examine the function of learning techniques in the agriculture sector as moreover several learning technique classifiers and their applications to the study of the soil fertility and water level of field and condition management.

Traditional farming methods tend to manage fields uniformly, ignoring the underlying regional variance present on the vast majority of farms. Precision farming is management method made possible by the advent of appropriate information technologies. It offers a framework that enables agriculture managers better comprehend and manage what occurs on their farms. Precision farming, which represents a better balance between reliance on traditional knowledge, information management, and intensive technologies, is anticipated to become considerably more common in the twenty-first century. Crop farmers can now use technologies such as systems for global positioning, portable field sensors, environmental monitoring, sensing, communication with soil nutrients through sensors, and controllable application methods. The application of these technologies in agricultural research to generate the working knowledge needed to improve crop production methods, however, have an established technique. This paper clarify way new technology are used generate recommendations for field condition management during periods of low soil fertility in various location of India.

KEYWORDS:[Nitrogen(K), Phosphorus(P), Potassium (K), Farming, Precision Agriculture, Soil, Water, Moisture, Crop, Sensors, Machine Learning, Field Condition Management, Temperature.]

PROBLEM STATEMENT: Crop prediction on the basis of soil N, P, K values, water and weather condition using learning techniques and IOT.

I. INTRODUCTION

Agriculture is an essential and sensitive research topic, and very person aids farmers by developing innovative solutions to present system issues, engaging in new agriculture research and innovation, and getting government financial assistance. These initiatives immediately benefit our farmers.

The same is being worked on in computer engineering; significant progress has been made. in this area with the use of newly created approaches, such as software and hardware, which directly supported our farmers in making an easy and rapid decision for greater agriculture production. Furthermore, some agriculture research is being conducted on soil quality, water level, and weather forecasts, as water is crucial for growing food and cultivating crops. Given current rates of population increase, our capacity to manage remaining water resources efficiently will be critical in providing agriculture's critical food requirement. Given how frequently the weather changes in many agriculture areas, it is increasingly necessary to monitor the climate. There are several types of climate monitoring systems, from basic automatic weather monitoring systems to more complex ones. Innovation, however, is what propels technical advancements and determines where cutting-edge, ever-evolving technologies like artificial intelligence and the internet of things are used. In order to track, anticipate, and estimate variations in meteorological and climatic conditions, modern. Hybrid technologies are likely to use data from dependable and unstructured sources, including field systems satellite observations, and prediction models.

High precision methodologies, procedures, and tools would be quite beneficial in this scenario for a project that comprises monitoring, data extraction, models, algorithms, and computations. It gives detailed recommendations for

Crop according to various soil components. Many machine learning algorithms developed throughout the previous decade and published by various authors will be examined in this project, while considering various soil nutrient characteristics such as organic carbon, electrical properties, Nitrogen(N), Phosphorus(P), Potassium(K), and PH value. Computer, electronics, and other specialists are making strides after generating novel ideas, initiatives, and agricultural practices that appear simple, cost effective, and beneficial to farmers. Apart from that, the Government offers a variety of research facilities.

II. LITERATURE SURVEY

The presented results can be clarifying the majority common factors that impact machine learning performance and help to choose the optimal strategy for a particular task in soil study[1]. An examine of various machine learning classifier for prediction purpose is soil is good for certain crop in respective region, with a focus on PH, NPK, features [2]. Calibrate sensors which record soil moisture and apply wireless technology by installing wireless sensors in specific locations within the vineyard giving the ability giving constantly monitor soil moisture and microclimate parameters leading to better management of the field, More accurate soil moisture forecasting [3]. In this research, we machine learning methods proposed for predicting soil in advance. To make the prediction, we used number of linear regressions, support vector regression and recurrent neural network, for the as a result that multiple linear regression outperforms support vector regression and recurrent neural networks [4]. By using ML applications in the agriculture field worked prediction of organic carbon and other soil parameters moisture content, crop yield prediction, disease and weed detection in crops and species detection[5]. Concentrating on spreading the proper seed based on soil requirements to maximize production and profit[6]. A survey on recent studies regarding the crucial water management issues in agriculture, driven by advance technologies[7]. Digitalize the farming practice and thus contribute farmers to get the most out of their practices without relying on the weather[8].

III. EXISTING SYSTEM

India has a very long history of agriculture, and it's a common practice to grow crops on India soils without paying any regard to soil conservation. The impact of this is deteriorates and saturated soil, which results in low productivity[9]. For almost all crops, the average yields are the lowest in worldwide. The demand for compost and soil fertilizer has led to this problem[10]. For good production and soil Needs to be well nourished. Intercropping, crop rotation, traditional organic composting, integrated crop animal farming, shifting cultivation, and slash-and- burn farming are examples of common traditional agricultural techniques. Spreading fertilizer manually over a field without understanding the exact nutrient requirements with relation to the soil at any given time [12].

IV. PROPOSED SYSTEM

In proposed system we are attempting to enhance farming technique from traditional to precision agriculture. The accuracy and effectiveness of farming practices can be considerably improved by using soil sensor's real-time data. The NPK sensors monitor the quantities of Nitrogen, Phosphorous, and Potassium in the soil. one such sensor is utilized, along with DHT11 sensor, soil moisture and PH sensor. The system goal is to assist farmers in making informed crop decisions. Along with live data, past data from temperature and humidity from the website is collected and kept to improve accuracy. To be certain and accurate in crop forecast, the project examines temperature and humidity levels in the field-live data acquire using the DHT11 sensor and historical information gathered from the website and /or Google, the type of soil used by farmer, and historic rainfall data. The dataset was trained with learning network. The dataset used for training contains temperature, humidity, and crop PH value matching these factors. The corresponding history and real time data are retrieved base on the parameters. The precision provided by several machine learning approaches is compared to be able to obtain the most exact result, which is then presented to the consumer. In addition to the best crop, moreover the system suggests the best crop fertilizer. Choosing proper algorithm is the important step in the machine learning, Random forest gives more accuracy but SVM is faster and accurate than random forest, If the data is Multidimensional and having large number of feature in that case SVM having better accuracy than Naïve Bayes, that's why we choose SVM (Support Vector Machine) algorithm for the crop prediction, and support vector machine gives more accuracy and efficiently works on large amount of data.

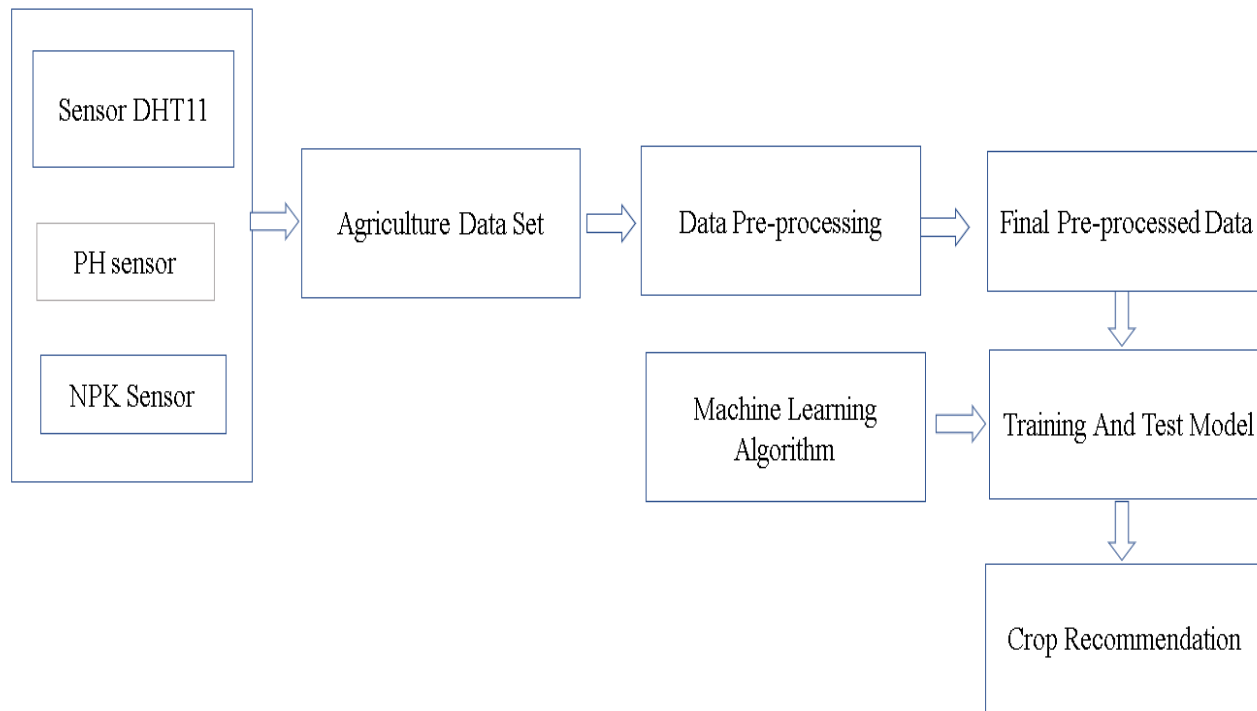


Fig 1: Architecture of Proposed System

V. CONCLUSION

In this paper, research suggests a new approach to smart agriculture based on emerging technology: Machine learning and Internet of things. Using both current and historical data improves the outcomes accuracy. Comparing several ML algorithms also improves system accuracy. This technic will be utilized to alleviate farmer’s challenges and boost amount of quality of their work. System is a possibility improved further by incorporating the following features: the usage of DHT11 sensor, soil moisture sensor, PH sensor to improve crop prediction accuracy. The authors of this study reviewed ML application for precision agriculture. The impact of AI and IOT on smart management is reviewed, along with quick introduction to the most often used ML algorithm in precision agriculture. The main aim is to give high profit to farmers by producing high quality and high quantity crop using machine learning techniques and Internet of things (IOT).

REFERENCES

1. Machine Learning Strategy for Soil Nutrients Prediction Using Spectroscopic Method: Janez Trontelj ml. and Olga Chambers., Sensors 2021, 21, 4208. <https://doi.org/10.3390/s21124208> <https://www.mdpi.com/journal/sensors>
2. Analysis and Prediction of Soil Nutrients PH NPK for Crop using Machine Learning Classifier: Disha Wankhede., ResearchGate See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/343049660>
3. Wireless Sensor Network for Precision Agriculture : Tagarakis A., Liakos V., Perlepes L., Fountas S., Gemtos, T., 2011 Panhellenic Conference on Informatics. 978-0-7695-4389-5/11 \$26.00 © 2011 IEEE DOI 10.1109/PCI.2011.60
4. Crop Recommendation System for Precision Agriculture: S. Pudumalar, Ramanujan, R. Harine Rajshree, C. Kavya, T. Kiruthika, J. Nisha. 2016 IEEE Eighth International Conference on Advanced Computing (ICoAC). 978-1-5090-5888-4/16/\$31.00@2016 IEEE



5. Water Management in Agriculture: A Survey on Current Challenges and Technological Solutions
6. ABDELMADJID SAAD,ABOU EL HASSAN BENYAMINA,ABDOULAYE GAMATIÉ 2020(IEEE)
7. Intelligent Farming System with Weather Forecast Support and Crop Prediction :Udit Shandilya Vidhi Khanduja.(IEEE)Authorized licensed use limited to: Auckland University ofTechnology. December 23,2020 at 16:57:03 UTC from IEEE Xplore.
8. Soil Moisture Prediction Using Machine Learning: Shikha Prakash Animesh Sharma Sitanshu Shekhar Sahu., Authorized licensed use limited to: University of Edinburgh. Published on September 04,2020 at 07:00:21 UTC from IEEE Xplore.
9. Machine Learning Applications for Precision Agriculture: A Comprehensive Review Abhinav Sharma, Arpit Jain, Prateek Gupta, (Student Member, IEEE), And Vinay Chowdary Received December 8, 2020, accepted December 20, 2020, date of publicationDecember 31, 2020,date of current version January 11, 2021.
10. Smart Crop Prediction using IoT and Machine Learning: Archana Gupta DharmilNagdaPratiksha Nikhare Atharva Sandbhor, International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NTASU - 2020 Conference Proceedings
11. Crop yield prediction using machine learning: A systematic literature review :Thomas van Klompenburga, AyalewKassahuna, CagatayCatalb, [Computers and Electronics in Agriculture 177 \(2020\) 105709](#) Contents lists available at [ScienceDirect](#)Computers and Electronics in Agriculture
12. Crop yield forecasting using data mining”Pallavi Kamath , Pallavi Patil , Shrilatha S , Sushma , Sowmya SGlobal Transitions Proceedings 2 (2021) 402–407 Contents lists available at ScienceDirect Global Transitions Proceedings
13. An efficient algorithm for predicting crop using historical data and pattern matching technique Anjana, Aishwarya Kedlaya K, Aisha Sana, Apoorva Bhat, Sharath Kumar, Nagaraj BhatGlobal Transitions Proceedings 2 (2021) 294–298 Contents lists available at ScienceDirect Global Transitions Proceedings
14. Crops yield prediction based on machine learning models: Case of West African countries Lontsi Sadio Cedric a , Wilfried Yves Hamilton Adoni bRubblyAworka a , Jeremy ThouakessehZoaea c, Franck Kalela Mutombo a e , Moez Krichen f g , Charles LebonMberiKimpolo, Smart Agricultural Technology 2 (2022) 100049 Contents lists available at ScienceDirect Smart Agricultural Technology



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