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[ijrset@gmail.com](mailto:ijrset@gmail.com)

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# Using Machine Learning, Crop and Fertilizers Prediction for Drip Irrigation System

Gujar Sayali Satish<sup>\*1</sup>, Ithape Shreya Santosh<sup>\*2</sup>, Yele Pratiksha Jagdish<sup>\*3</sup>,

Suryawanshi Komal Bhanudas<sup>\*4</sup>, B. D. Thorat<sup>\*5</sup>

Department of Computer Engineering, Shri Chhatrapati Shivajiraje College of Engineering, Pune, India (MH),  
Savitribai Phule Pune University, Pune, India

**ABSTRACT:** In Today's World of Internet and Smartphones, the Smartwork is an important factor. Agricultural Industry plays a major role in the Process of economics development as well as Gross Domestic Product of India. One of the major issue in industry to lack of knowledge about soil nutrients, best Crop and useful Fertilizers. Machine Learning plays important role in Agricultural Industries. In Agricultural Industries one of the major issue is to Accurately Identify Fertilizers for the Crops which is mainly depends on Drip Irrigation System. Only few Farmers uses scientific approaches remaining uses the past process or believing the myths in society. Precision Agriculture is important in today's life. Precision Agriculture also called as the Smart Farming have an innovative tools to focus on current challenges. The Mechanism that can operate this most recent technology is Machine Learning. Thus the Paper Purpose is a smart Farming technique for Crops depends on the Drip Irrigation Using Soil Nutrients like NPK(Nitrogen, Phosphorous, Potassium). The important part of the Agriculture is the use of the Pesticides and Fertilizers. Fertilizers helps to keep the Crop safe from insects and Improve the Quality of Crop. Use of Fertilizers may be Expensive and Harmful if we cannot used with care and precaution.

**KEYWORDS:** Machine Learning, Crop, Fertilizers, Irrigation, Smart Agriculture, NPK Sensors

**Problem Statement:** Crop and Fertilizers Prediction on the basis of Soil Nutrients like N, P, K Values using Machine Learning Techniques and IOT.

## I.INTRODUCTION

The Drastic population growth of the world will increase to 9 billion approximately. Food Requirements increases by 70% due to rapid increase in population due to urbanization and the availability of the land for the Agriculture will decrease in coming years. Machine Learning techniques have emerged as powerful tools for Predicting Crop and Fertilizers. The Application of Machine learning techniques for prediction is the main subject of this Research Article. In India, Majority of the Population is dependent on Agriculture for their Livelihood. Many new technologies such as Machine Learning and Deep Learning, are being Implemented into Agriculture so that it is easier for farmers to grow and maximize their yields. Machine Learning and Deep learning enhance the knowledge about best Crop and Fertilizers. The Paper contain Crop and Fertilizers Prediction System in which NPK Sensor check the Nutrients level. Based on that nutrients level, Machine predicts the Crop and fertilizers for Drip Irrigation System. Peoples are increasingly used to depends on machines, rather than doing their daily needs manually in order to save their time. Even farmers had to use so much of man- power to fulfil their needs in cultivation in old days, now they can gain the same amount of work with less time and less manpower by using a single machine operated by only one person. If there is a way to identify the best crop and Fertilizers according to the environmental conditions in the different areas and the soil type of their ground on their own, it will be a very useful solution for better results and to save time. We know nutrients that is Nitrogen, Phosphorous, Potassium are provided to the plants, nitrogen plays a important role because it is responsible for generation of the chlorophyll in leaves and amino acids and it is necessary for internal reactions in plants. Thus the nitrogen deficiency can have serious impact on plant growth. As nitrogen is the mobile nutrient, the deficiency is usually seen in leaves. So, our aim is to come up with an automatic soil testing system which not only will analyze the soil samples but also provide acceptable crop and Fertilizers information at free of cost and consuming less time. This crop and Fertilizers prediction is finished by not just considering the fertility of the soil but also by the quantity of soil within specific region. There is Different types of soil we see in different areas like Red soil, Black Cotton Soil, Forest Soil, Laterite Soil, Alkaline Soil, Rock soil. We know that different soils needs different crop and Fertilizers according to their conditions.



**II. LITERATURE SURVEY**

The common way to check the soil Nutrients levels is lab testing rather than using some specific Sensors. The Goal of paper is to decrease the time by using NPK Sensor to predict the Soil Nutrients levels. The Paper Publish in 2019 is “Smart Crop and Fertilizers System”. In this paper the technology is where Internet Of Things and Machine Learning for the crop and fertilizers prediction. Depends on the lab testing result but in this system for the lab testing another processes more time. Research has carried on agricultural sector using different techniques that can help to solve agricultural problems which have focused on the most yielding crops. In July 2017 group of the researchers Sabina Rahaman, Harshitha M, Anusha R, Bhargavi Y. R, and Chandana M from Department of Electronics and Communication Engineering BMS Institute of Technology, Bangalore 560064 have invented a research which detects NPK Ratio Level Using SVM Algorithm and Smart Agricultural Sensor System. They have integrated a sensing module with an Image processing setup to monitor the essential details needed for plant growth from the soil. As inputs, they have got Temperature, Soil Moisture, and pH level.

The Paper publish in 2019 that is “Web Based System for Farmers”. In this paper methodologies used are as follows: FP tree algorithm is used to predict the appropriate crop Based on the current NPK values of soil. And its limitation are This method would put Pressure on soil to matched its fertility with required conditions of soil.

**III. EXISTING SYSTEM**

In Existing System, the mobile applications will suggests more suitable crop list according to soil conditions, soil moisture level, Humidity. In past work done is only for the Crop Prediction using different soil properties and different data mining techniques. Fertilizers Prediction system is not taken into consideration. If there prediction of fertilizers then they for the disease which seen on crop then this system predict the fertilizer or pesticides.

**IV. PROPOSED SYSTEM**

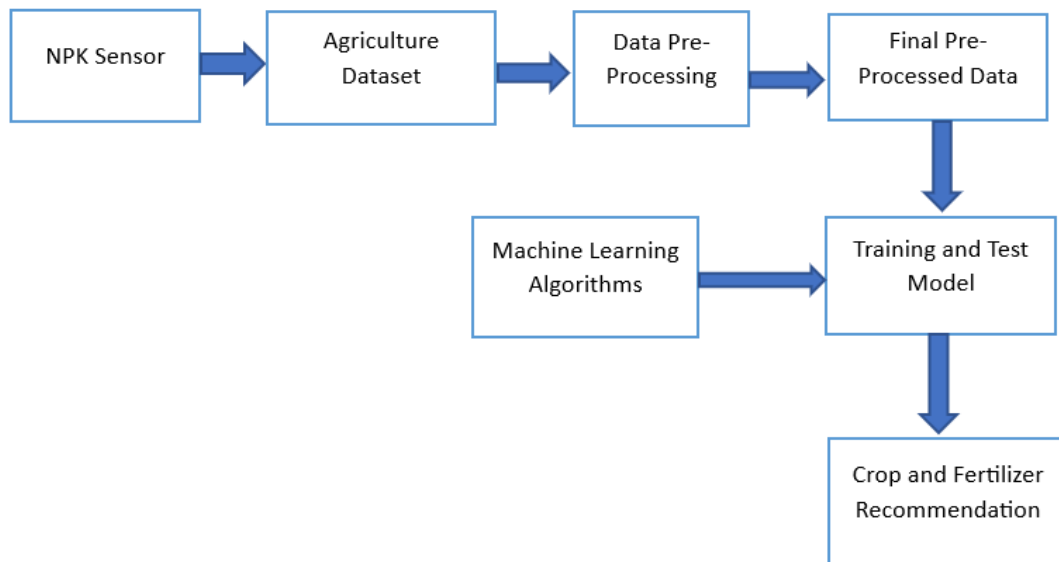


Figure: Architecture of Proposed System

The proposed system will check Soil Nutrients and pH values and predict the Crop and Fertilizers recommendations if needed depending upon the quality of soil. The Functionality of the Architecture is as follows: The system take input of Soil Samples. Using sensors predict the soil nutrients. Using this sensors determine the percentage level of Nitrogen, Phosphorous and Potassium of the soil. Training and testing are two important steps in building Machine Learning model. The Training process involves using labelled dataset to teach the model to prediction.



In our Project we use Support Vector Machine Algorithm(SVM). Support Vector Machine is supervised machine learning algorithm used to solve classification and regression problem.

## V. CONCLUSION

Thus we created Crop and Fertilizers Prediction System for Drip Irrigation Using Machine Learning with the help of NPK Sensors. It is designed to developed and test the Soil Nutrients level using NPK Sensors to predict essential Crop and best required Fertilizers which mainly in liquid form because it is used for Drip Irrigation Hence we need water Soluble Fertilizers. This is used to improves the crop production with reduction in cost of fertilizer and thus improves the agricultural industries sector in India. The data is gathered in the database related crop details and soil conditions which provides total fertilizer requirement.

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