Soil Monitoring System For Crop Recommendation

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Abstract- *The cultivation in our nation is much reduced due to lack of interest, scarcity of agriculture. But that also yields to very less production due to lack of awareness about the land dryness, no timely pesticide usage and suitable crops for the land. Hence the smart agriculture plays a vital role in promoting cultivation. It gives the solution by means of placing the sensor in the cultivation land to measure the soil efficiency. In this paper it describes how the sensed data will be processed and stored in cloud and from cloud the data will be relayed to the registered farm owners through their pH one or device in user understandable form. Also if pH rate of the soil is low the application suggests the pesticides to be used to improve cultivation .This will be very helpful to the farmers who are away from the land, and improves the crop cultivation*

Soils have important direct and indirect impacts on agricultural productivity, water quality, and the global climate. Soils make it possible for plants to grow by mediating the biological, chemical, and physical processes that supply plants with nutrients, water, and other elements. This project provides a brief overview of the soil monitoring system using sensors. Various soil sensors are used to measure temperature, moisture and humidity. We predict the values with the output obtain form tested values and base upon that values we suggest the crop for farmer. The information from the sensors in the soil is display on android app. This information is very helpful to crop recommendation to farmer

Keywords- Linear Regression, Soil Moisture, Machine Learning, Embedded System, Sensors

I. INTRODUCTION

India is a developing nation with a very large population. Due to increasing population , the basic need such as food and water is increasing day by day. Thus there is a need of saving these resources and utilize them in an efficient manner. Since water is one of the most important elements in our daily life, thus we must use efficient ways to utilize water and save it for future generations. Soil organic matter is a major source of N used by crops. Organic matter plays an important role in maintaining soil quality. Increase the nutrient capacity of the soil and release nutrients to plants.

The problem faced in the agriculture field is that the farmers are suffering much to get the farm lands survey reports quickly. Lack of facility to suggest for the chosen crop. Lab testing method will not able to visualize the soil parameters fort the live monitoring.

Existing System:

In the existing system the soil can be tested just to check out the fertility and the moisture level. It has to be given to the lab for testing the soil. It will take some days to fetch the result. For a new agricultural area, without knowing or monitoring the important parameters of the soil, cultivation will be difficult and so the farmers suffer financial losses.

Literature Survey:

The paper[1] have presented the research possibilities for the classification of soil by using well-known classification algorithms as J48, BF Tree, and OneR and Naïve Bayes; in data mining. The experiment was conducted on data instances from Kasur district, Pakistan. We have observed the comparative analysis of these algorithms have the different level of accuracy to determine the effectiveness and efficiency of predictions.

The paper[2] A specialized approach is being used to design the soil monitoring system for measurement and control of the plant growth parameter, i.e. soil moisture. The data which we get from the measurement has shown that the system performance is quite dependable and correct. Soil moisture sensors are used in detecting the changes which are required and to calibrate irrigation practices. These minor changes in irrigation practices help in increasing yield and saves water. The lead to proper irrigation management using soil moisture sensors is disciplined monitoring of the sensors to get the soil moisture level when the data obtained is in the determined range for the specific soil type.

The paper [3] In this paper we developed a recommendation system to help farmers in choosing appropriate crops. From the experimental evaluation, we found that the developed system can recommend appropriate crops to a satisfactory level. Although in this paper, we considered the system for upazila level, the system can be extended to the union level and also to village level which can provide much better crop recommendation. Variations in crops can also be considered and user feedback can be added in further research.

The paper [4] presented a case study of wireless sensor network system for monitoring the surrounding humidity, temperature and water content level of crops. The system offers remote monitoring access and alert function to users with less human intervention. We tested the performance of the network under single-hop and multi-hop configurations and we compared their reliability for real-life applications. It
has been demonstrated that the multi-hop topology can cover a larger area compared to single-hop topology but it trades-off the network reliability and energy consumption. Future improvement can address the energy constraint issue by using energy-harvesting mechanisms and introducing power management techniques such as switching some inactive nodes into sleep mode.

The paper [5] This work would help farmers in sowing the right seed based 2016 IEEE Eighth International Conference on Advanced Computing (ICoAC) 36 on soil requirements to increase productivity and acquire profit out of such a technique. Thus the] farmer's can plant the right crop increasing his yield and also increasing the overall productivity of the nation. Our future work is aimed at an improved data set with large number of attributes and also implements yield prediction.

The paper [6] The efficient irrigation management practices based on the monitoring of the moisture in the soil provide a great benefit for the appropriate amount of water applied in the fields. This paper presents design and development of a soil moisture sensor and a response monitoring system. The probes used in this sensor are made of nickel which is an anti-corrosive and robust material for use in agricultural related applications. The response monitoring system measure the moisture of the soil, compare it with the desired values given by the user and generate alert if soil moisture goes below desired value. It helps in problems related to growing of crops in which irrigation is required at irregular interval. It is also helpful in monitoring of soil moisture in golf fields.

The paper [7] Agriculture plays the major role in economics and survival of people in India. The purpose of this project is to provide embedded based system for soil monitoring and irrigation to reduce the manual monitoring of the field and get the information via mobile application. The system is proposed to help the farmers to increase the agricultural production. The soil is tested using various sensors such as pH sensor, temperature sensor, and humidity sensor. Based on the result, the farmers cancultivate the appropriate crop that suits the soil. The obtained sensor values are sent to the field manager through the Wi-Fi router and the crop suggestion is made through the mobile application. Automatic irrigation system is carried out when the soil temperature is high.Crop image is captured and it is sent to the field manager to suggest pesticides.

II. Proposed System:

The system propose monitoring of various soil parameters using sensor networks and information display on android app. Various soil sensors are used to measure temperature, moisture and humidity. The proposed system is capable of determining Soil moisture, temperature, humidity.

The system is to design an integrated circuit to automatically measure the soil moisture, environmental temperature and humidity. The outcome of this project is monitoring soil and crop recommendation based on the processing of different parameters of soil and result is display on android app. This project replaces the primitive method of soil testing and so, the farmers get to know about their soil quickly. The result provides by this project helps the farmers to take up the decision.

1 .Show Humidity
2. Show Moisture
3. Show Temperature
4. Crop Recommendation
5. Irrigation System

Proposed System Architecture Diagram

III. ADVANTAGES AND DISADVANTAGES

Advantages

- It is well established
- It is very Fast

- It is beneficial for the farmers to increase their crop yield
- It is user friendly
- It Reduces the farmers workload
- It alerts on soil resources to the predefined number
- It works anywhere in the world

Disadvantages

Soil moisture samples had to be taken from distances of about 1-2 meter away from the installed probes and were different from the soils that are directly in contact with the sensing volume of the probe.

Scope:

In future the system can be included with more number of sensors like metal and sound sensors in order to make the agricultural field intrusion free.

In future the same system can also be developed to sense the amount of nutrients required and to supply the same in correct quantities.

IV.CONCLUSION

Recommendation system for crops and soil based. This application beneficial to the farmers in terms of crop production. The application is user friendly so everyone can use it.

This project replaces the primitive method of soil testing and so, the farmers get to know about their soil quickly. The result provides by this project helps the farmers to take up the decision. The remote monitoring of the soil temperature rate has been done with the very minimal cost.

The values can be viewed by the farmer's anywhere in the world at any time. Hence this system gives more accurate moisture, humidity and temperature rate of the soil which play vital role in the agriculture. The temperature sensor, Humidity sensor and soil moisture sensor can be interfaced to the arduino controller to assess any further data.

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