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E-Crop Management System

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Abstract. Farmers are under pressure to produce more food and use less energy and water in the process. A remote monitoring and control system will help farmers deal effectively with these pressures. Agriculture operations waste 60% of water consumed each year. Now more than ever, new technologies for water conservation must be adopted. The proposed system is an automatic irrigation system that does the operation of a system without requiring the manual involvement of persons. Without going farmer to farm using our system they can know what to do on the farm. By installing the sensors in the field it checks the soil moisture in the ground. Once the value is less than 500 automatically water is pumped into the field. Our system generates the temperature, humidity, and soil moisture readings from the field and sends them to the mobile application to see the farmer. Our system also gives the information for controlling the pests in the field. The objective of this system is farmers can avoid wastage of water and they can save time without going to fields. Farmers can also know how much amount of fertilizers can be used for their fields. The advantage of this system is farmers can save water, save time, save money, and with our mobile application farmers can see the readings of temperature, humidity, and soil moisture from anywhere. They can also see the pest control system for four crops i.e, Paddy, Sugarcane, Groundnut, Mirchi.

Keywords: IoT, Mobile App, Smart Agriculture

1 Introduction

E-Crop Management System is an IOT based application that mainly focuses on farming to help farmers. Farmer can see the readings like temperature, humidity, and soil moisture of the field. By these readings, the farmer can know when to spray pesticides or sprinkle the seeds in the field. Farmer can benefit as they can know the readings and they can know what to do for their fields. Farmer can save money by knowing the readings of the field and they can know when to spray the pesticides in the field. The farmer had to put the soil moisture sensor in the farmer's field by this sensor farmer get the soil moisture level in the field. DHT11 sensor had to place in the field to detect the temperature and humidity from the field. These readings will be displayed on the LCD and send to the mobile application. If the soil moisture level is less than 500 then automatically water is pumped into the field else moisture level is greater than 500 it automatically stops pumping water into the field. In Mobile Application farmers can also see the reading levels of the field and also farmers can also see the pesticide's images and bring some idea about that pesticide. In the pesticide image, the mobile application had prescribed the chemicals which are to be used.

2 LiteratureSurvey

[1] proposes an electronic system which includes the applications of IoT. The system monitors aspects such as moisture and can control the moisture level based on a threshold value. Thus the proposed system is capable of monitoring and controlling the parameters locally.

[2] implements an automatic irrigation IoT system based on Raspberry Pi to modernize and improve crop productivity. The aim of the proposed paper is to increase crop productivity with less water consumption by using humidity and temperature sensors and calculating the quantity of water required for irrigation based on the sensor data, thus maximizing the crop yield.

[3] proposes collecting data from IoT sensors and send it to the server over Wi-Fi module. The system is implemented for a poly-house.

[4] aims to develop a product that uses low power Bluetooth and Low Power Wide Area Networks (LPWAN) communication modules for smart farming. MQ Telemetry Transport (MQTT) communication method is used in monitoring and control systems, which is an IoT dedicated protocol, thereby enhancing the possibility of development of agricultural IoT.

[5] implements a model to collect data from sensors to design and implement practical tasks that use different real datasets to predict values using and comparing new machine learning techniques with the standard techniques.

[6] gives research information about decision tree algorithms in data mining for analyzing the soil dataset and predict soil fertility and thus crop production.

[7] gives out a method for testing the soil fertility

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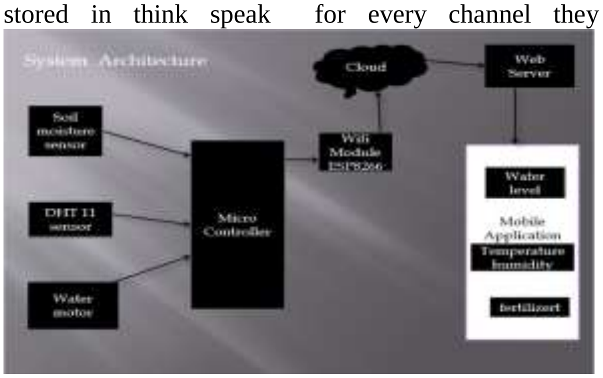
depending on the values collected by the sensors. The soil fertility once determined, is used to suggest the best suitable soil fertilizer for the crop.

3 ProposedSystem

The proposed system is an automatic irrigation system that does the operation of a system without requiring the manual involvement of persons. Without going farmer to farm using our system they can know what to do on the farm. By installing the sensors in the field it checks the soil moisture in the ground. Once the value is less than 500 automatically water is pumped into the field. Our system generates the temperature, humidity, and soil moisture readings from the field and sends them to the mobile application to see the farmer. Our system also gives the information for controlling the pests in the field. The objective of this system is farmers can avoid wastage of water and they can save time without going to fields. Farmers can also know how much amount of fertilizers can be used for their fields. The advantage of this system is farmers can save water, save time, save money, and with our mobile application farmers can see the readings of temperature, humidity, and soil moisture from anywhere. They can also see the pest control system for four crops i.e, Paddy, Sugarcane, Groundnut, and Mirchi. **Automatic Irrigation**:-An **automatic irrigation system** does the operation of a **system** without requiring manual involvement of persons. Without going farmer to farm using our project they can know what to do on the farm and how to do on farm. It gives report the farmer how the crops are growing and also controlling the insects by fertilizers. Our project saves and reduces the time, money and burden for the farmers.

4.System Architecture

Micro controller is audio no board A soil moisture sensor ,DHT 11 sensor ,and relay module is connected to water motor (5v) and it is connected to aurdiono .
Here code is dumped in microcontroller
The data which is collect by the sensor is sent to the think speak server by using Wi-Fi module the data which is stored in think speak for every channel they



will be API keys so we place the read API key and write API key
In mobile application app we place this keys in code to display in moisture value and temperature and humidity values in mobile app and at the same time this data is stored in thinkspeak server also in mobile app we are placing four crops
Paddy
Ground nut
Sugarcane
Mirchi.
We have displayed the pic of diseases and name of it and pest controller for crop

System Requirements

Software: aurdino, MIT app maker.

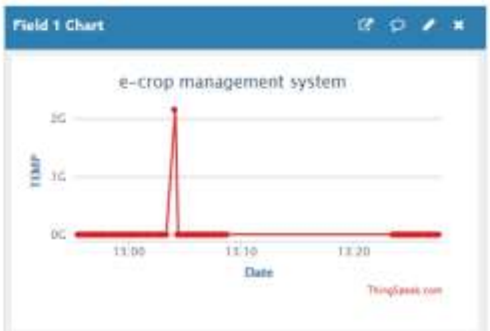
Hardware: Soil moisture sensor, dht11 sensor, relay module, no demcu, battery, water motor, system Intel i generations lo Edina, 4GB ram.

Soil moisturizer sensor The LM 35 sensor is highly used because its output voltage is linear with the Celsius scaling of temperature. It does not provide any external trimming. It has a wide operating range. The maximum output is 5V. The output will increase 10mV for every one degree rise in temperature. The range is from -55 degrees to +150 degrees. There are three terminals as Vcc, Ground and the analog sensor. It consumes minimum amount of electricity. Thus, it is energy efficient. It is very efficient in horticulture. It is user friendly to use.A small charge is placed on the electrodes and electrical resistance through the sensor is measured. As water is used by plants or as the soil moisture decreases, water is drawn from the sensor and resistance increases. Conversely, as soil moisture increases, resistance decreases

.5. Results

IOT can play a huge role in automating the process of agriculture. Farming based on IOT will help the farmers to improve the productivity of the crops and to reduce the waste Smart agriculture using IOT can be basically termed as building a wireless system for automating the irrigation process and monitoring the crop field with the help of various sensors. These various sensors can be light, humidity, temperature, soil moisture, etc. using these modern technique farmers can monitor the crop anytime and from anywhere. These reasons make the modern technique of agriculture i.e. IOT highly efficient and reliable technique to persuade with.

As the world is trending into new technologies and implementations it is a necessary goal to trend up in agriculture also. Many researches are done in the field of agriculture. Most projects signify the use of wireless sensor network collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity to a greater extent. Hence automation must be implemented in agriculture to overcome these problems.



Conclusion

This is to conclude that by using our application farmers can automatically pump water to the fields and view the reading like temperature, humidity and soil moisture of the field by that farmer can save time and money.

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