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Agritech--Eco-Irrigation for Indian Farms Using IOT

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ABSTRACT: Agriculture is the main source of livelihood in today's world. As new technology has been introduced in the modern era there is a need to bring the advancement in the domain of agriculture also. Internet of things in Agriculture domain will reform the traditional way of farming and enhance the crop productivity. Crop specific Irrigation helps the farmers to stay connected to his field from anywhere and anytime. Crop Specific irrigation is achieved for each crop using mobile application. Various sensors are used to monitor and collect the information about the field conditions.

KEYWORDS : Arduino, IoT, Sensors.

I. INTRODUCTION

One of the main aspects of human survival is the agriculture which is the main source of food.[7] Most of the farmers in our country use traditional way of farming which is hectic process to analyze data manually related to soil and crops. Monitoring and controlling the flow of water is done in the agricultural farm. Crop specific irrigation of different crops is used which leads to Intelligent[2] irrigation. This leads to saving a lot of time of farmer. Eco irrigation provides a solution for watering the crops without any wastage and prevents over and under irrigation[4]. In this methodology, soil moisture sensors are setup in farm and it senses the moisture level and then transmits the information to arduino which in turn operates the controlled flow of water supply.

Our system will allow the farmers to monitor the moisture level in the field and help in controlling the supply of water in field. When moisture level goes below the certain level, water will be supplied through our system thus achieving proper solution using IoT. By Crop specific irrigation and applying it to various crops such as sugarcane, jowar, wheat, the problem of over and under irrigation is reduced.

II. LITERATURE SURVEY

Various surveys have been carried out on how irrigation can be made more efficient such that there is no wastage of water. The researchers have used different ideas depending on the condition of the soil and quantity of water different technologies used and the design of the system was discussed by researchers.

This paper aims at reducing the wastage of water and the labour that is used to carry out irrigation manually[3]. However use of technology in field of agriculture plays an important role in increasing the production as well as in reducing extra human efforts. The proposed system aims at detecting the moisture content in the soil using sensors that are directly placed into the soil[1]. The sensors sense the water level of the soil, if the water level is not adequate then the user will be notified through a message that will be sent to the application which would be installed on the user's mobile phone. The farmer decides to water the plants depending on the moisture values.

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III. PROPOSED SYSTEM

We propose an Eco irrigation technology for Indian farms that help farmers precisely schedule how crops need to be watered and how much water these plants require. Using IoT , growers are able to monitor the soil moisture levels of their plants. It solves the problem of over and under irrigation and also concentrates on crop specific irrigation .The reason it is more reliable is because it is developed on the Android operating system and Android-based smartphones are very common and highly available almost everywhere.The farmer selects the crop to be watered based on the water levels found and can see the status through the smartphone application.

Figure shows the block diagram of Eco-Irrigation technology for farms.

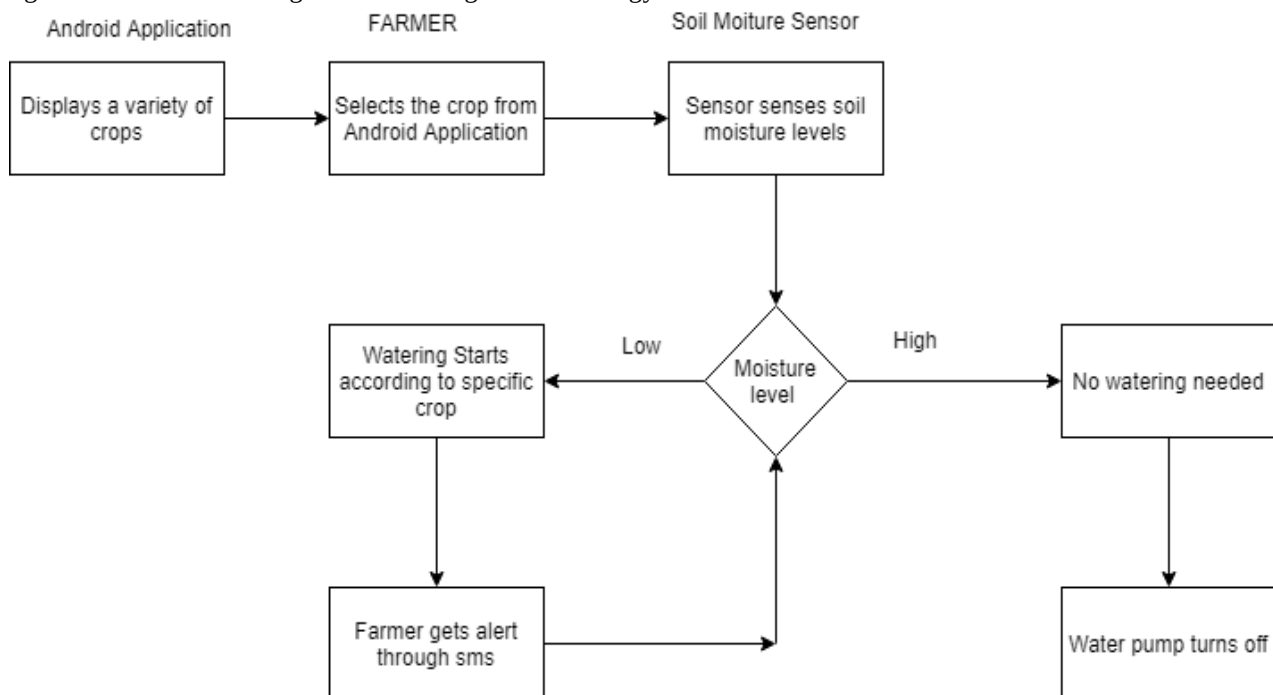


Fig : Block diagram of proposed system

The farmer decides to water the plants depending on the soil moisture values. The farmer gets the alert through sms about the watering status .

Crop specific irrigation by applying it to various crops such as sugarcane,jowar and wheat etc. is done through android application.This solves the problem of over and under irrigation.

IV. METHODOLOGY USED

We can take input from sensors and decide the watering based on moisture values . Based on the sensor information, indication should be given to the farmers through mobile sms system. The main objective of this system is to save water and reduce human intervention in the agriculture field. Continuous monitoring the status of watering through sensors and provide indication to the farmer for taking necessary action is done through the system.Various crops are supplied water according to the different water levels required by them.

Methodologies and Applications Used are:

a.Android application

Various sensors are being used in this system when it senses the moisture level then the user will be notified through a message that

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will be sent to the application which would be installed on the user's mobile phone with the help of android application.

b. Sensors

One of the important sensors is moisture sensor. Moisture sensor would sense level of water in the soil for specific crops. Based on the water level this system would have a knowledge on how much water need to irrigate the crops. Too much water in the soil would affect the usage of nitrogen of the roots. At the same time the oxygen at the roots will be insufficient. Each type of crops would require various level of water. As such level of water indicate by moisture would be different depend on the type of crops.

c. Crop specific Irrigation(Intelligent Irrigation)

The soil moisture sensor detects soil moisture content in soil and display values on the app. The farmer decides on watering of crops based on the values. The farmer turns the motor on if soil moisture content is low. Also crop specific irrigation is achieved for different plants by using soil moisture sensors. The system will be beneficial and works in cost effective manner. It reduces the water consumption to a greater extent. The System is very useful in areas where water scarcity is a major problem. The crop productivity increases and the wastage of crops is very much reduced using this irrigation system. Hence, it achieves the optimal solution using IOT.

d. Arduino Uno Board and motor pump

The program code is uploaded to the arduino uno board and the program compiles and runs successfully. The board is connected to the soil moisture sensor and motor pump and supplies water to the plants through the pipe.

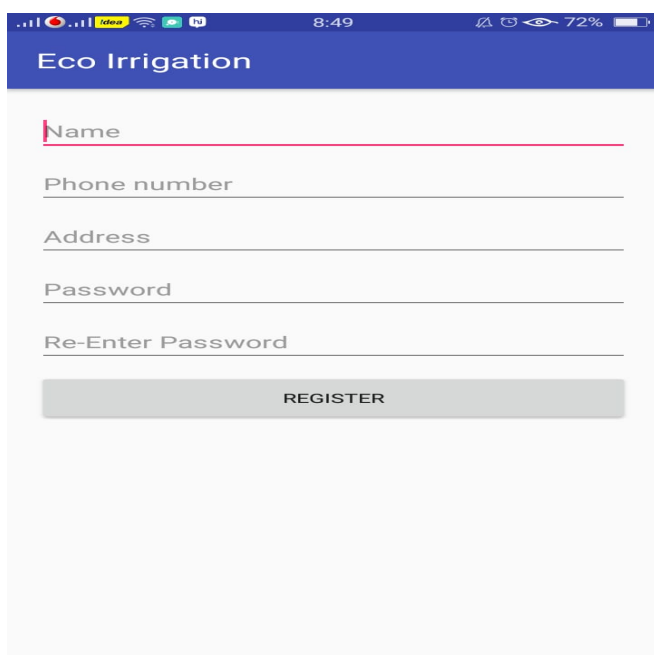
e. Wifi module

The arduino board is connected to the android application through the wifi module. Through this the farmer is able to view the results on the smartphone screen.

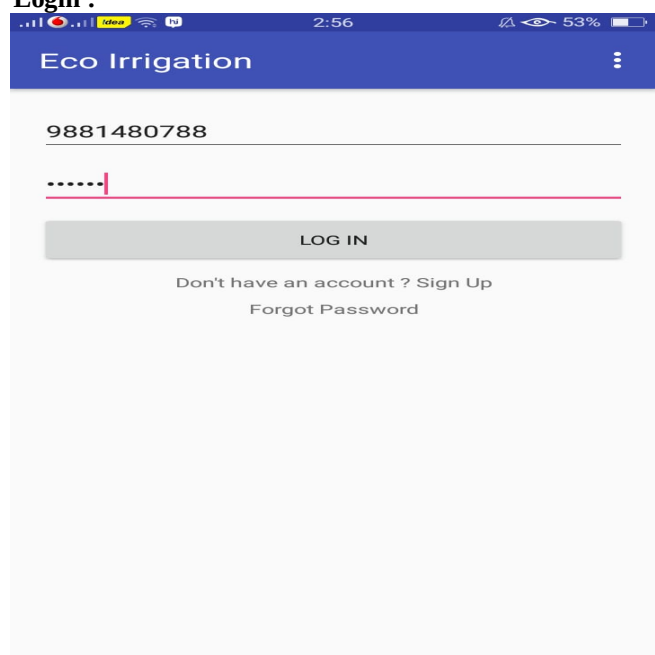
V.RESULTS WITH OUTPUT UI

The output screen of the mobile android application looks as follows. The farmer logs into the application and selects the crop and can view the watering status of the crop selected. The farmer can select to start the watering process depending on the values.

Registration:



Login :



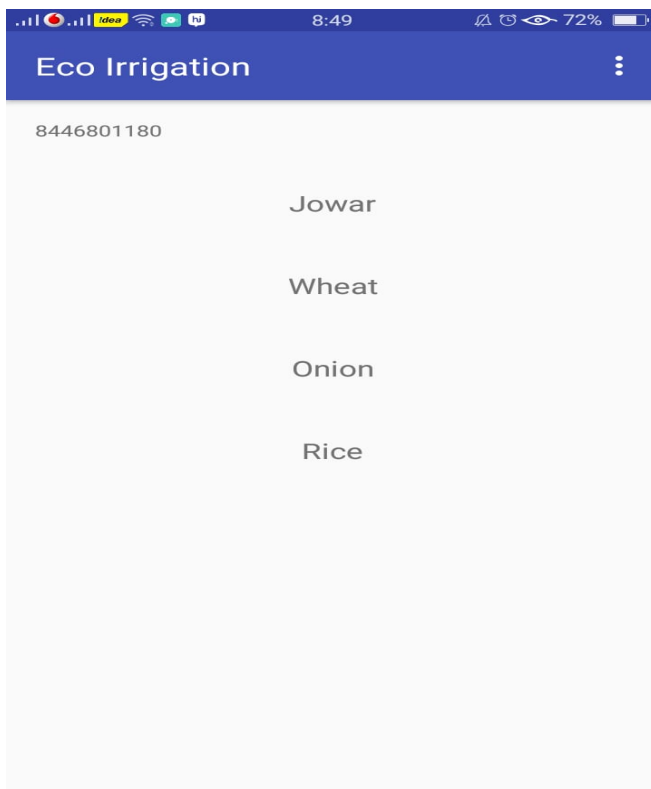
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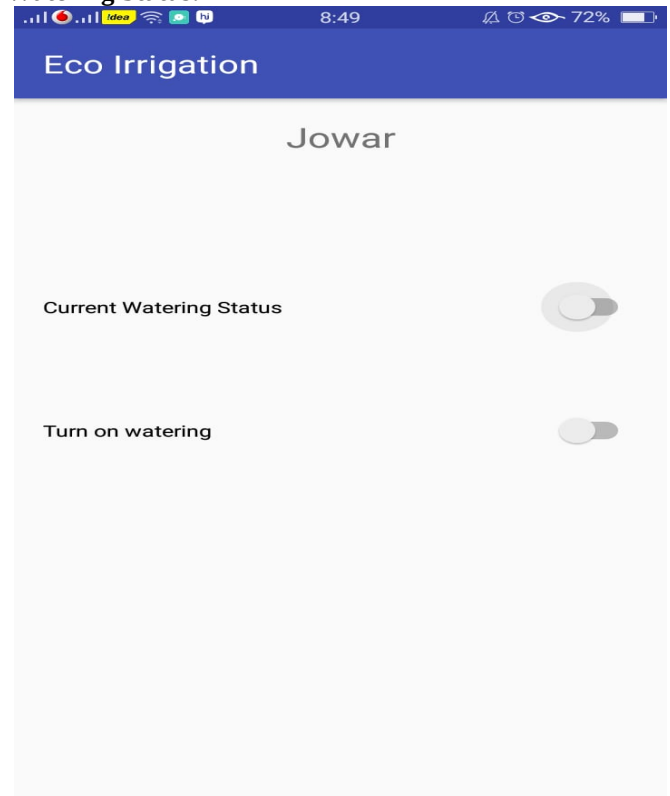
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Selection of Crop:



Watering Status:



VI. CONCLUSION

This paper presents a Eco-irrigation system using IOT. Implementation of such a system in the field can definitely help to improve the yield of the crops and overall production.

IOT has important significance in promoting agricultural information. This system is quite affordable and feasible. This system of irrigation is also helpful in the region where there is scarcity of water and improves their sustainability, thus preventing over and under irrigation.

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