

Smart Farming Technology For Sensing Soil Moisturing Using Iot

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Abstract: Automated irrigation system in agricultural fields is very much needed for day to day agricultural practices and will also be useful to the farmers and to the people who have garden and are facing problem to water the plants when they are not in home without wasting water. Since water is very much essential for living organisms in daily life and its demand will be increased in future years, we must adopt a automated system for conservation of water. In automation system, the crops or plants are watered automatically by sensing the moisture level and temperature of the soil through controlled irrigation. This is a mobile Integrated and smart irrigation system using IOT base. The main objective of this project is to control the water supply and monitor the motor status through a Smartphone using external conditions such as temperature and moisture level of the soil.

Index Terms: IoT, Irrigation, Soil Moisture

1 INTRODUCTION

India is very much rich in agriculture and almost 70% of the people depend on agriculture. Manual irrigation is done in India. The basic necessities required for irrigation is soil properties like moisture and temperature of the soil. Using IOT technology, efficient use of water for irrigation purpose in farms can be developed. The temperature and moisture content is recognised by humidity and soil moisture sensor and based on the moisture level of the soil ,the motor is switched ON/OFF and text message is sent to the mobile number to which the system is connected through GSM module. This is very much useful in certain cases like if the farmer /gardener is unable to attend the irrigation it results in wastage of water and electricity. Excess water in fields also leads to damage in soil. In order to avoid these circumstances, smart and automatic irrigation system is implemented and tested. The system uses temperature and moisture of the soil to ON /OFF the motor. Automatic implementation is done with the help of embedded c language in Arduino software. The rest of the paper is organized as follows: Section II introduces literature survey. Section III deals with proposed system. Compound description is presented in section IV Implementation are discussed in section V followed by conclusion in section V.

2 SMART FORMING METHODS

The proposed smart irrigation system using IOT consists of Arudino Uno, GSM module, Relay 2 channel, LCD display screen, soil moisture sensor, motor. The aim of the research proposal is to develop a remote irrigation system for the fields automatically. The device is designed in such a way that when the soil reaches higher temperature the motor gets switched ON and irrigate the fields. The device is connected to the motor. When the command is initiated motor pumps the water into the fields.

Also a SMS is sent to the assigned number automatically saying "Soil dry, Automatic motor on" which will ensure the proper functioning intimation to the assignee and also the particular temperature is displayed on the LCD screen which is connected to the Arudino. Also it is developed to get switched OFF when the soil temperature reaches low and also sends a SMS saying "Soil wet, Automatic motor off". The device will be helpful for remote irrigation and monitoring. The purpose is to reduce man power along with proper irrigation. This also enhances the proper utility of water without wasting it. This will reduce the risk of over irrigation or less irrigation.

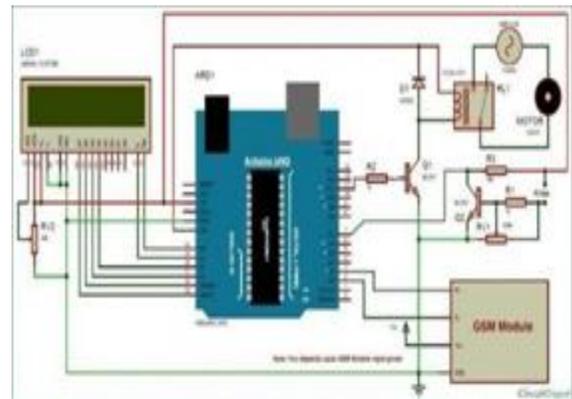


Fig. 1. Circuit Diagram

Theorem 5: It also displays "Soil Wet" in LCD Display.

Theorem 6: It displays the message and temperature in the LCD display.

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Fig. 1. Overall Proposed Prototype

4 RESULTS & DISCUSSIONS

In this project soil moisture sensor and temperature sensor is used to find the temperature and moisture of soil and supply the water based on the requirement. It is analog temperature sensor which display temperature in Celsius degree using LCD display. Soil moisture sensor contain two copper electrodes where one electrode produce the current and other electrode would be ready to absorb the current. Soil moisture sensor is inserted in soil, which would have water content that makes current passing easier on other hand if water content is less it makes current supply slow. When soil moisture get dry it send the text message as "Soil is dry, motor on" to the mobile number given in the code and water would be supplied to the plant. When soil get wet again it send the text message as "Soil is wet motor off" to the same mobile number. Sim is inserted in GSM module SIM900A which would be useful for all type of network it may be 3g or 4g. Where other GSM module doesn't have this facility. Now the sim is inserted to send the text message when soil moisture gets dry and motor is on. GSM module is connected to Arduino which is used to make coding where it is embedded C code is used to send the message to the specific mobile number. In this project we could view the temperature and soil moisture using LCD which is 32 bits display used to view the temperature and soil moisture condition using the sensor. This arduino based project where arduino used to make coding for various language. In this project C code is used to send the text message to particular mobile number. Relay is used to turn on and turn off the circuit when condition is met the relay get closed and turn on the motor to water the plant. Motor is used to water the plant when it get dry and it turn off automatically when it get wet where it would be useful to avoid waste of water and also help to save plant from dryness.

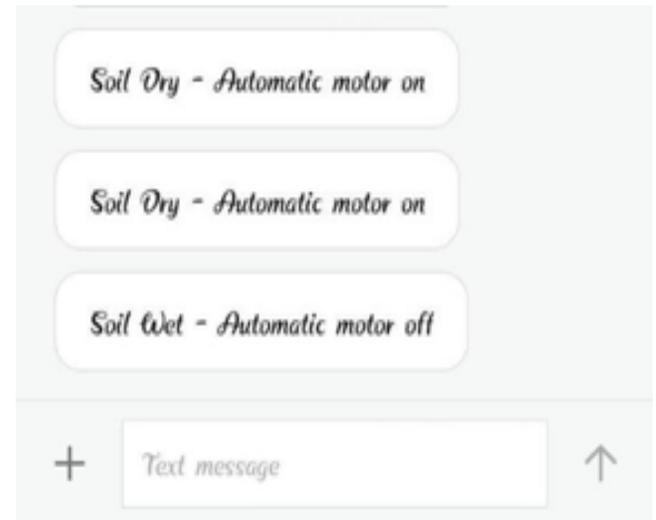


Fig. 3. Output

5 CONCLUSION

The smart irrigation system that we developed offers us a solution for managing the irrigation process in the agricultural field and in terrace gardening in an automatic way. This helps us to increase productivity and also reduces wastage of water. We used sensors such as temperature and humidity sensors to detect the field temperature and humidity values and perform the automatic irrigation. By the temperature and humidity values are noted by using the GSM with the sensors we can control the water flow. The developed system avoids over irrigation, under irrigation and reduces the wastage of water. The major advantage is that we can change the values of temperature and humidity according to the place we deploy our system. Comparing to other automated systems our system is more efficient and cheap. This system can be implemented in agricultural lands, parks, terrace gardening etc.

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