

AUTOMATED SMART FARMING MONITORING AND CONTROLLING SYSTEM USING WIRELESS SENSOR NETWORK

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ABSTRACT

As Technology Developed in all over, it is necessary to trend up agriculture. With increasing pollution, the demand for agriculture productivity is rising to meet the goal of zero hunger. WSN play's key role in smart agriculture IOT sensors are used to provide necessary information about agriculture field it contains humidity sensor, temperature sensor, soil moisture sensor, rain detector sensor, solar system, light sensor.

These systems start to check humidity and moisture level. These sensors are used to sense level of water and if level below the range, then system automatically start's watering. Sensor network and Internet of thing give the information of humidity, moisture level. IOT innovation help get collect the data on condition like atmospheric shield temperature and productivity of soil. With the help of IOT and WSN system can decrease the expense and update the efficiency of standard that are necessary for farmers. Our project not just recreates the permeative methods, but it also helps the farmer to identify additionally farming serves, that create a new group by opening the new roads for work.

Keywords: IOT, WSN, agriculture

I. INTRODUCTION

Agriculture is done in every country from ages. Agriculture is the practices and art of smartly farming the plants. Technology contributes to globe improvement in term of product quality, environmental condition. It was the main development in the rise of sitting human civilization. Agriculture is done manually from ages. In the large scale the people are entering into new technologies and implemented. All of these the main goal to increase and improve the agriculture also. IoT plays a very important role in smart agriculture. IoT sensors are capable of providing information about agriculture fields. There is a proposed Model that use an IoT for smart agriculture system using automation. This IoT based Agriculture monitoring system makes use of wireless sensor networks that collects data from different sensors deployed at various nodes and sends it through the wireless protocol. This smart agriculture using IoT system is powered by Arduino Nano; it consists of Temperature sensor, humidity sensor, light sensor, soil moisture sensor, rain sensor, LCD display module, Wi-Fi module and pump. When the sensor-based agriculture monitoring system starts it checks the humidity level, temperature, light intensity, moisture level and rain. After collection of all data system send this to webpage. In this way we can access all this data from anywhere in the world through the internet. The development of smart agriculture system is the breakthrough that has a major impact on the whole world where the internet network can be extended to realm of internet of thing, which is connecting the internet network to an object and then controlling it remotely. One of the things that need to be taken in agriculture activities is the irrigation and scheduling to be programmed. WSN have become a necessary for agriculture application and become a reality today going hand in hand with the success of theoretical research contribution that the field has seen during the last decade.

II. METHODOLOGY

The development of a conceptual framework for smart farming there is a requirement of methodology. With the help of these methodology there is trying to solving the aim of the problem. A multi-case study approach is used to evaluate the applicability of the presented framework in the context of smart farming.

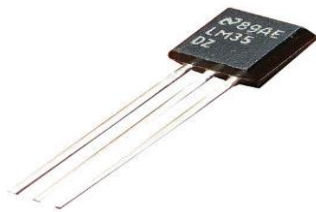
Sensor

There are so fast challenges in society to detect the weather change, decreased rainfall, and increasing demand for extra food to sustain billions of people globally are placing a lot of influence on farming. That provides negative impacts on traditional farming practices. So that we are here come with sensors technology for smart agriculture.

Sensors used in agriculture for smart farming are known agriculture sensors.

Temperature sensor

The LM35 sensor mostly used because the output parameter like voltage corresponds to the Celsius temperature measurement. It has a wide range of performance. The maximum output is 5V. The output will increase by 10 mV in every single degree increase temperature. Ranges from 55 degrees to +150 degrees. There are three terminals like VCC, Ground and analogy sense. It uses a small amount of electricity. Thus, it saves energy. It works very well in agriculture. Icon easy to use.



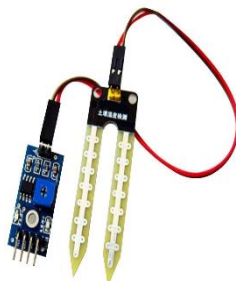
Light Sensor

Light sensor also known as photoconductor. It converts light energy detected to electric energy. It generates an output signal indicating the intensity of light by measuring the radiant energy that exist in very narrow range. It can be used to measure illuminance, respond to changes in the amount of light received, or convert light to electricity



Soil Moisture Sensor

Soil moisture sensor is one kind of sensor used to gauge the volumetric content of water within soil. The moisture of soil plays an Essential role in the irrigation field as well as in garden of plants. As nutrients in the soil provide that food to the plants is essential to change the temperature of the plants. These sensors normally used to check volumetric water content, and another group of sensors calculate a new property of moisture within soil



Rain Sensor

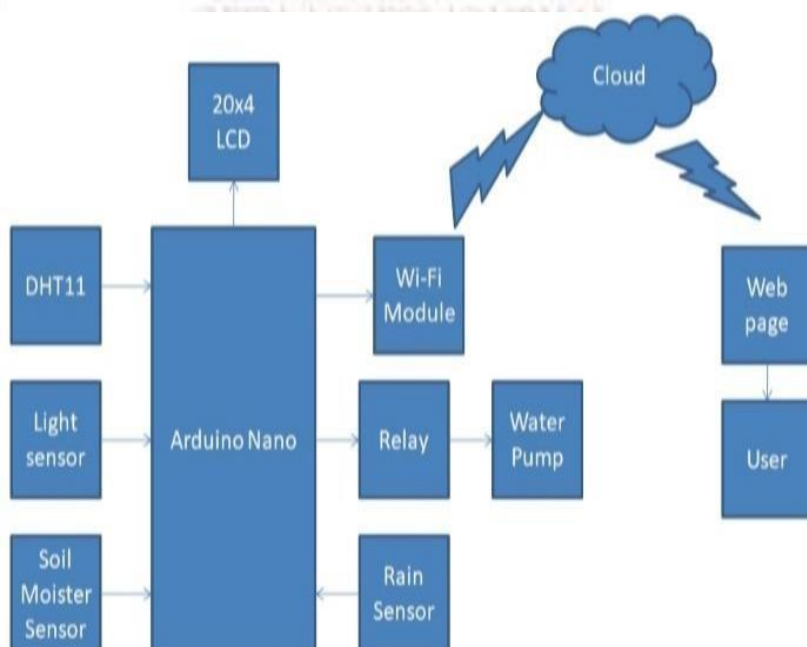
Rain detector sensor is easy to use device that can detect rain fall. It can also measure the intensity of the rainfall. It can be used in automobile to control the wipers automatically. This sensor is a resistive dipole, and based on the moisture only it shows the resistance. The sensor module uses good quality of double-sided material. This sensor is used as water preservation device and this is connected to the irrigation system to shut down the system in the event of rainfall.



Block diagram

Working of Model

- The system is manufactured around Arduino nano board. It is main directing part of the system.
- DHT11 sensor is used to measure temperature and humidity. It is connected to Arduino nano board to measure temperature and humidity.
- Light sensor is used to measure light intensity. It is connected to Arduino nano board to measure light intensity.
- Soil moisture sensor is used to measure Soil moisture. It is connected to Arduino nano board to measure Soil moisture.
- Rain sensor is used to detect the rain. It is connected to Arduino nano board to detect the rain.
- Relay is used to switch the water pump.
- Water pump is used to turn on the flow of water to crops.
- Wi fi module is used to get the internet access to the system
- The LM35 sensor is widely used because its output voltage corresponds to the Celsius temperature measurement. It has a wide range of performance. The maximum output is 5V. The output will increase by 10 mV in every single degree increase temperature. Ranges from 55 degrees to +150 degrees. There are three terminals like VCC, Ground and analogy sense. It uses a small amount of electricity. Thus, it saves energy. It works very well in agriculture. Icon easy to use.



III. MODELING AND ANALYSIS

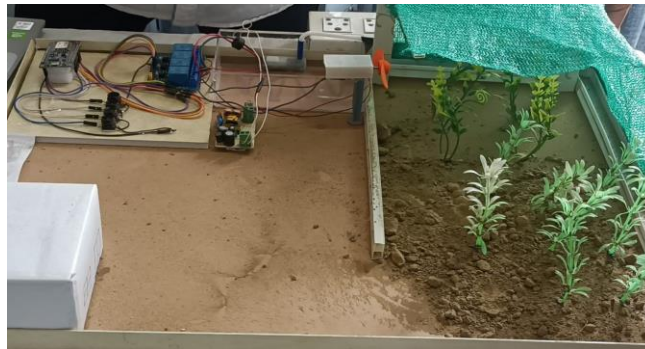


Figure 1: View of model.

IV. RESULTS AND DISCUSSION

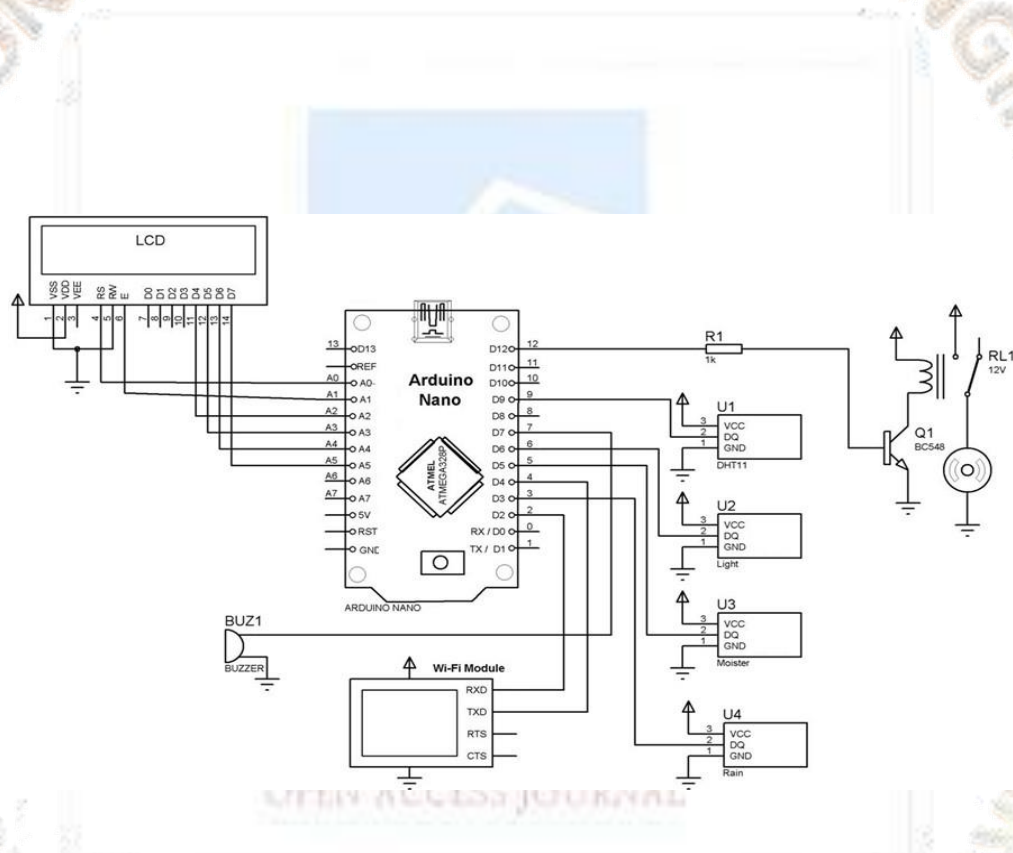


Figure 2. Circuit diagram

The main aim of this project is to implement the modern technology in required fields like agriculture. Using wireless sensor technology in agriculture, this system makes agriculture monitoring easy. The benefits of this system like save the water and worker time that are vital for that the maximum in current agricultural state of concerns. Consequently, using the sensor network in fields of agriculture makes clever irrigation and smart planting. The information from IoT is sent to the client using cloud. Consequently, any changes inside the crop may be identified effortlessly and early analysis is achieved as such.

V. Conclusion & Future Work

Automated Farming activities use sensor and Node MCU. With the help of sensor and Node MCU together do a system that effectively regulates resource requirement in the agricultural sector. This program will hear all the environmental parameters and send data to user by application on mobile Phones. The user will take control action depending on whether this will be done using an actuator. This property allows the farmer to develop the crop in the way that the crop needs. It leads to higher, longer crop yields production time, better quality and less use of

protective chemicals. By using sensor, we can increase crop yields in agricultural farms. With this platform, we can beware of weather conditions such as humidity and Temperature. We can also change important resource requirements through automation, moisture and dryness of the soil. Using an IR sensor, we can see insects and humans along the way in the field. This can alleviate the farmer challenges facing climate. So, farmers can monitor farm conditions using a mobile phone or computers and also control through manually or by automations. These programs provide excellent yields and produce the best results. Using these plans to increase the excellent crop yields agricultural production in India. With Wireless sensor technology one can control of crop yield and growth. It can also reduce farmer involvement and efforts.

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