SMART AGRICULTURE USING IOT

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Abstract

IoT means Internet of Things; it is a booming technology in all over automation technologies. Actual time weather observance is the most needed for agriculture, as much agriculture allied issues can be solved by actual time weather observance system. Water is a precious and necessary one in the world. So we need to use the water in need level and avoid the water wastage, it saves the water. We use sensors in the agriculture industry to do smart agriculture. This sensor aided to check the agriculture environment and provide the data about the land fields. In this system, monitor the agriculture by using wireless sensor technology. By using the sensors we can monitor real time data's are water level, soil moisture, temperature and humidity.

Keywords: Antenna IoT, Smart agriculture, Sensors,

1. Introduction

Now with the help of the Internet, technology is constantly developed. But it was not in the agricultural sector. Internet is important one in monitoring and collecting information. IoT helps to monitor the real time data and store the data in server. Agriculture is a major industry in India, and cultivated food is widely used. Agriculture, with its associated fields, is the largest livelihood in India. Seventy percent of rural households rely on agriculture for their livelihood. Traditional methods have an effect on the low cultivation of grain and byproduct. Crop yields can be increased by the use of scheduled machines. We are implementing modern science method in agriculture to increase production. By using IoT, we can do higher production in agriculture field with minimum effort by observing soil performance, temperature and moisture verification in agricultural zones.

The recent advance technology of IoT and wireless Sensor Networks are combination into traditional method can prompt to farming modernization [1]. Today's population growth is fast. By 2050, it will be 9.7 billion and we need to elevate the formulation of yields to feed those billion people [2]. Agriculture is the back bone of all villages; proper monitoring agriculture system converting village into smart village [3]. It is important for cultivators to have knowledge of the aerial status of their acres. Abundant issues in organizing acres can be avoided when environmental goals are met and productivity can be increased [4]. According to a report, using modern agriculture, China yields 415 million tons of crops per year. In different circumstances, in the contempt of having more agricultural land (than China) India harvest 218 million tons per year [5]. IoT helps to improve the efficiency of the agriculture and its help to farmer people check the soil conditions in real time. Enormous growth in science and technology leads to a progress in a gradual pace [6].Recent development in the field of agriculture leads to increased focus in many smart inventions[7]. Even if it's a semi arid or arid areas efficient water uses or applications and management is of major concern [8]. IoT is a latest technique in which various technologies can be deployed specifically[9]. In mean time IoT vision has been developed and came to reality[10].Some functionalities are Device management, Data base and data access[11]. IoT links all the modules which we use in our day to day life by means of Internet also by allowing them to transmit and receive information's[12],[13].

In this paper, Agriculture system weather monitoring is developed which based on IoT, in which multiple sensors are connected through a single board[14],[15]. These system consists the sensors are DHT11, water level sensor, soil wateriness sensor. From the particular sensors are connected and controlled by arduino. The remaining of the article is prioritized as follows: The proposed Agriculture structure is discussed in section 2. In section 3 discussed the architecture of system. The system results and discussions are given in section 4. The final is provided in the last section.

2. Proposed technology

To overcome the problem occurred in traditional agriculture method, we are introduce the IoT positioned agriculture survey method. The proposed structure consists of temperature sensor, soil wateriness sensor, humidity sensor and water level sensor. Farmer people can monitor concurrent data of agriculture circumstances. Farmers need to see every day whether water is sufficient for farming. We are connecting the water level sensor in water tank which help to fill the water automatically. Farmer will check the level of water in anywhere and anytime. If the water level low in soil then controller starts the pumping motor with the help of relay and the pumping motor pump the water in soil. If the level of water in soil reaches the required level arduino controller stop the motor with the help of relay. Using these full sensors will help you understand the soil condition and assist them propagate the right crop that can branch out in those circumstances.

3. System architecture

The system helps to monitor the weather details in real time. As in Figure 1 all the devices are connected and controlled by Arduino. DHT11, water level sensor and soil moisture sensor are connected in input pin of arduino. Wi-Fi module connected in UART pin of arduino. System Architecture shows in Figure1
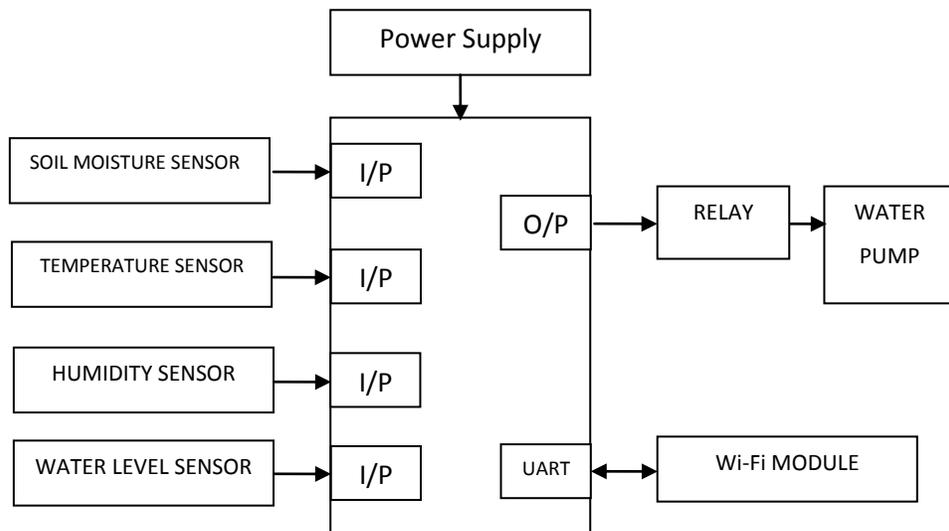

Figure.1: System Architecture of Smart Agriculture

Arduino mega:

It is the heart of the arrangement. It controls all devices. Get the data's from devices and send to the user using Wi-Fi Module. The operating voltage range 5V. Figure 1.1 shows Arduino. It has

- 54 I/P & O/P pins
- 16 Analog I/P
- 4 UART
- 16 MHZ crystal oscillators

Figure.1.1: Image of Arduino

Temperature Sensor:

In this system LM35 temperature sensor is passed down. It measures the temperature. If the degree range is 0 Celsius, output voltage is 0V. There will be rise of 0.01V for every degree Celsius rise in temperature. Figure 1.2 shows temperature sensor.
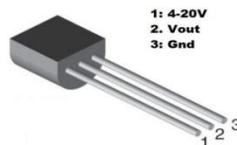

Figure.1.2: Image of Temperature Sensor

Humidity Sensor:

It is the heart of the arrangement DHT-11 is a humidity sensor. It is measure humidity and temperature. Low cost temperature and humanity sensor. No need of analog input pins. Figure 1.3 shows Humidity Sensor.
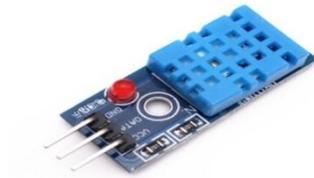

Figure.1.3: Image of Humidity Sensor

Relay:

It controls one circuit through open or close contact with another circuit. It's one of the switches. . It shows Figure 1.4.

Figure.1.4: Image of Relay

Motor:

Motor converts the electric energy into mechanical energy. In this system motor rotate in two direction one forward another one is backward direction. If water level low in soil, arduino switch on the motor with the help of relay. Figure 1.5 shows motor.

Figure.1.5: Image of Motor

Soil Moisture Sensor:

It's used to extent the moisture present in the ground. The Sensor output as per level of moisture in soil. Figure 1.6 shows Soil Moisture Sensor.
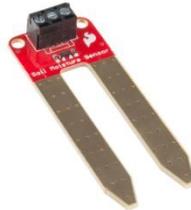

Figure.1.6: Image of Soil Moisture Sensor

Water Level Sensor:

It's account to extent the water height in the sump or others. Sensor sends the water level to controller then controller check the level and on/off the motor with the help of relay. Figure 1.7 shows the water level sensor.

Figure.1.7: Image of Water Level Sensor

4. Results and discussions

Our proposed All the Sensors are connected to arduino at proposed pins. The proposed system tested and output verified. In view of this article, we are noted the live humidity and temperature zone. With help of this system, farmers improve the agriculture rate and avoid the waste of water. Figure 2 shows the test picture of smart agriculture.
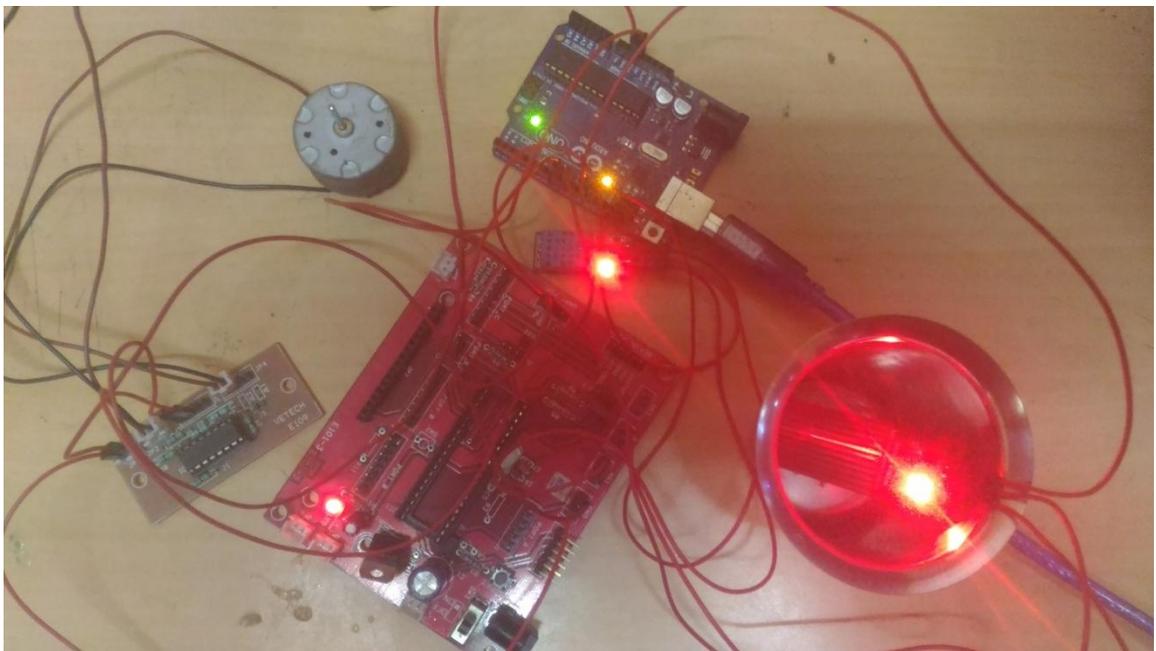

Figure. 1.8 Setup picture of Smart Agriculture

5. Conclusion

In view of this article, a smart agriculture is implemented. IoT-based sensors are used to survey the dryness of the ground and temperature in Agriculture fields. IoT sensors are high efficiency and accuracy, so easy to obtain the direct data of ground wateriness and warmth in agriculture field. The water level indicator is used, so prevents the waste of water and saves water; it helps the farmers to expand their production. This IoT sensor always helps farmers to increase their food formulation, as well as to get direct messages about the soil moisture and temperature of the environment, which helps them achieve better results than traditional methods.

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