IOT Based Farm Irrigation and Fertilizer E-Recommendation System

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ABSTRACT

India is predominantly an agricultural country. Agriculture is the most important occupation for most Indian families. It plays an important role in the development of a large agricultural country. Water is an important resource for agriculture. Irrigation is one way of providing water, but it is sometimes a huge waste of water resources.

Therefore, we have implemented a project called "IOT Based Farm Irrigation and Fertilizer E-Recommendation System" in order to save water and time in this regard. In this application, we use various sensors such as temperature, humidity, soil moisture sensors that know many parameters of the soil, and we water the soil automatically by turning the engine on/off according to the soil moisture value. In addition, choosing the right fertilizer for the soil and crops is an important and essential part of agriculture, so this project helps farmers choose the right fertilizer for the soil and yield from the recommended fertilization system based on soil moisture and humidity.

Keywords : Internet of things, Arduino processing unit, Soil moister and temperature sensor

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I. INTRODUCTION

Agriculture is the main source of income for India's largest population and contributes to the Indian economy. However, agriculture needs water and we use more water than annual precipitation, so it has become important for growers to find ways to conserve water while achieving maximum results. The Internet of Things (IoT) is a technology that can be used on mobile devices to monitor device performance. This project helps farmers irrigate their fields effectively using an automatic irrigation system based on soil moisture. The system is designed to prevent unnecessary water entry into the land.

Continue to monitor temperature, humidity and humidity using the temperature, humidity and humidity sensor and send these values to the specified IP address. Android apps continue to collect data from the given IP address. A relay connected to the Arduino microcontroller controls the motor when the soil moisture exceeds the limit. Android app is a simple menu driven menu with 4 options. This includes

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physical conditions, humidity, temperature and humidity valu

The motor status indicates the current status of the pump. In addition, choosing the right fertilizer for land and crops is an important and important aspect of agriculture, so this project helps farmers choose the right fertilizer for their land and yield, with the use of approved automated fertilizers.

II. METHODS AND MATERIAL

This article [4] brilliantly represents a very important foundation and is nothing new. It uses a system with humidity, temperature and humidity sensors and uses the Arduino to do its job. It is semi-automatic because the user needs to quickly pay attention to the water edimension of the frame. The framework uses the GSM module for communication

This article [5] presents an idea for thecreation of an intelligent water floor using various sensors (eg temperature, soil, humidity and light).

The data is sent to the website for data parsing and preparation and is stored in JSON format. The light sensor detects the light that will activate the plant and the light is sent. They plan to use the interviews to develop the framework. Guaranteed to be 92% more efficient than other companies.

This article [6] IoT is used for water management in this project, as the moisture sensor recognizes the water in the soil and similarly notifies the customer with an alert on the PC connected to it.

The frame compares the moisture content to the limit and starts and stops absorbing the same amount of water. Since the framework uses a PC to interact with the Arduino board via the USB connection, it is limited in that it is unlikely to be used for home base. This frame uses Arduino board, humidity sensor and siphon.

III. MEASUREMENT

Various measurements were used for this project:
A. Moisture measurement.
B. Temperature measurement.
C. Humidity measurement

A. Moisture Measurement

Soil is a mixture of water and air that creates spaces between them, and substances such as minerals and natural substances. Soil weathering is supported to understand their distribution. Each classification has unique characteristics, so water retention limits vary from one to the next.

When water enters the soil, it begins to fill the space between the affected areas of the soil, a situation in which areas are completely flooded is called a wetland. This is short lived. At the same time, excess water enters the water profile due to gravity. At the same time, the shrinkage work provides gravity resistance and adjustment, thereby improving water descent.

B. Temperature measurement

Temperature measurement is important in many situations today. It also plays an important role in the production of plants, so temperature control is essential for good farming. There are many methods based on estimating the physical properties of the material as a function of temperature. Thermocouples, Thermistors, RTDs, Pyrometers, Langmuir Tests, Infrared etc. are some of them.

C. Humidity Measurement

Describe humidity in three ways. It is a measure of the amount of visible water vapor (water that splits the liquid into an imperceptible gas) in its surroundings. Humidity is not the true measure of water vapor in a predetermined volume of air. Relative humidity is the percentage of moisture present in your environment compared to the maximum humidity the air can hold, and it varies with temperature. For example, warmer air can hold more moisture.

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IV. METHODOLOGY

Soil Moisture Sensor Presets are fixed in the Microcontroller and are also used for fencing. The water automatically waters the plants when there is a certain point to start again and stop when the volume is needed, the microcontroller sends this information over the internet in the form of a wifi module ESP8266 connected to it over the IoT network. This improves automatic water usage as the pumps can be turned on and off with data supplied to the controller

A. Proposed System

Today, agriculture faces many problems due to the lack of sufficient water. Make smart irrigation to help farmers overcome the problem. In this system, various sensors such as pH, humidity, DHT11 are connected to the input pins of the Arduino microcontroller. The measured value of the sensor is displayed on the LCD. If the input value exceeds the threshold of the program, the pump is turned on/off by the relay circuit and connected to the driver circuit to assist the changeover.

B. Arduino Processing Unit

Arduino is a microcontroller board that provides a platform to control signals/outputs from various sensors and other modules. It provides an open platform-independent IDE, allowing programmers to generate and control electronic signals from plug-ins. One of the most popular Arduinos is the Arduino Uno, an 8-bit Atmel AVR microcontroller running at 16 MHz. Finally, these boards are inexpensive and have a very developed community.

C. Soil Moisture Sensor The

Soil Moisture Sensor is used to measure soil moisture. When the humidity value read by the sensor is higher than the threshold, it is a low level (0V) digital output, and when it is lower than the threshold, it is a high level (5V) digital output. A digital pin is used to directly read the current soil moisture to see if it is above the threshold. The voltage can be adjusted with the help of a potentiometer..

V. CONCLUSION

Together, a programmed irrigation system using a new remote control can provide an efficient system for managing resources and human resources. The framework also supports continuous remote monitoring of existing ecoregions. These innovations can now be combined to reduce costs. These generators are well controlled so use less energy and rely on energy sources like solar power to be completely independent. By using the Internet of Things, farmers often understand monitoring and early warning in agriculture.

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Cite this article as :

International Journal of Scientific Research in Science, Engineering and Technology | www.ijsrset.com | Vol 10 | Issue 2

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