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A self-watering and planting help system based on weather data that uses the Internet of Things

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Abstract- We are designing an improved water level device for agricultural lands in rural areas. It will automatically control the pumping of water, which will keep the water level in agricultural lands at a good level. It is used to automatically pump water to areas that need it based on the level of moisture in the soil and the humidity of the air. We set benchmark values for different crops and update the system's moisture level and watering time every time. Set a baseline value that will depend on the plants and the humidity of the air. We are using a Raspberry Pi 3 with a humidity sensor to measure the humidity level in the air and a wetness sensor to measure the moisture level of farmland. Both sensors were built in the Python programming language.

Keywords: Raspberry Pi, IoT, Humidity monitor, Moisture sensor

1. INTRODUCTION

IoT apps are making farming better in terms of quality, number, sustainability, and cost-effectiveness. The internet of things (IoT) is a type of network technology that connects everything to the internet so that information can be sent and received. These days, farming is very worried about not having enough water.Farmers can water their land more efficiently with this project's help. Based on the weather data, it might be.Using Android apps on a smartphone, this can be watched and managed.Our suggested method will help people who are just starting to take care of gardens. The Internet of Things (IoT) is changing agriculture and giving farmers new tools to help them deal with the huge problems they face. Agriculture has to deal with growing water shortages and limited land available while also meeting the growing food needs of a growing world population. These problems are being fixed by new, creative IoT apps that make agriculture production better in terms of quality, amount, sustainability, and cost-effectiveness. The Indian economy is based on agriculture. The world's population is growing very quickly right now, which makes farming more important to meet everyone's wants. That being said, farming needs irrigation, and since we use more water than it rains every year, growers need to find ways to save water while still getting the best yield. In modern times, however, farmers use a method of irrigation that they control by hand and water their land at regular intervals. Statistics show that agriculture uses 85% of the world's liquid supplies. This number will continue to be the largest user of water because the world's population is growing and more people need food. We need to make plans right away for long-term water use based on science and technology. These plans should include changes to technology, farming, management, and institutions. Rules about how much water each crop needs are used to guide watering systems that use the Internet. We can cut down on water waste and get the most out of science advances in watering methods by using the Internet and monitoring networks. So, it can greatly improve how water is used and raise the output of water.The Internet of Things (IoT) is a technology that lets you check on a device's function from your phone. The Internet of Things (IoT) is a way to connect and talk to things that are placed in different places, some of which may be far away from each other. The Internet of Things (IoT) is a type of network technology that lets anything connect to the Internet and share data. It does this by collecting data from different devices. The state of the gadget can also be changed with it. There will also be a transmission device in the central processing unit that will take data from the sensors and send it to the user's device. A better level of connection device, like a Wi-Fi module, will be used for this. The center section processes the data, turns it into useful data, and sends it to the user. People can look at the info on a small device, like a cell phone or a computer. These days, farming is very worried about not having enough water. With a controlled watering system that is based on how wet the dirt is, this project helps farmers water their land more efficiently. There is too much water flowing into farmland, and the planned method is meant to stop that. Using a temperature, moisture, and humidity sensor, readings of temperature, moisture, and humidity are constantly taken and sent to the given IP address. An app for Android continues to get info from that given IP address. When the soil wetness levels go over a certain limit, the sensors are controlled by the switch that is linked to the Raspberry Pi microprocessor.

EXISTING SYSTEM

In an existing system,only soil moisture values is considered that is likely to fail. Because , in a particular field moisture content is not same for every where. So ,our proposal is extension to by adding the temprature and humidity values .We compare the humidity and moisture level.In exisiting system they only compare the soil level using three sensor.but here we have to compare the humidity level of the environment.

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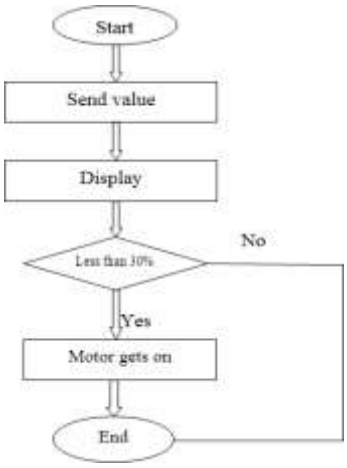
2. LITERATURE SURVEY



literature survey Primary investigation is carried out under the following stages, such as Understanding the existing approaches, Understanding the requirements, developing an abstract for the system. In this paper, soil moisture sensor, and humidity sensors placed in root zone of plant and transmit data to android application. Threshold value of soil moisture sensor that was programmed into a microcontroller to control water quantity. Humidity and soil moisture values are displayed on the android application. This paper on "Automatic Irrigation System on Sensing Soil Moisture Content" is intended to create an automated irrigation mechanism which turns the pumping motor ON and OFF on detecting the dampness content of the earth. In this paper only soil moisture value is considered but proposed project provided extension to this existed project by adding moisture and humidity values. Remote Monitoring in Agricultural Greenhouse Using Wireless Sensor and Short Message Service (SMS).In this paper they are sending data via SMS but proposed system sends the values to mobile application. This proposed paper is a raspberry pi based remote irrigation system developed for the agricultural plantation, which is placed at the remote location and required water provides for plantation when the humidity of the soil goes below the set-point value. But in this we did not aware about the soil moisture level so to overcome this drawback proposed system included with extra feature soil moisture value and temperature value which displayed on the farmer mobile application. “Irrigation Control System Using system app and GSM for Efficient Use of Water and Power” this system made use of GSM to control the system which may cost more so to overcome that proposed system used raspberry pi board which already consist of in build wifi module. “Microcontroller based Controlled Irrigation System for Plantation” In this paper old generation with lesser memory microcontroller is used to control the system but proposed system made use of raspberry pi board which is user friendly and it helps to dump the programs easily. “A wireless application of drip irrigation automation supported by soil moisture sensors” in this paper irrigation is carried out using soil moisture values but extend to this proposed system displays temperature and humidity values

FLOW CHART

3. PROPOSED SYSTEM

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The proposed system has been designed to avoid unnecessary water flow into the

agricultural lands. Soil moisture and humidity readings continously by using humidity and moisture sensor. The irrigation process done through sprinkler. Android application continously collects the data from the sensor. In this, we are additionally going to provide supplements control by remote method. This proposed work includes an embedded system for automatic control of irrigation. This project has wireless sensor network for real-time sensing of an irrigation system. This system provides uniform and required level of water for theagricultural farm and it avoids water wastage. When the moisture level in the soil reaches below threshold value then system automatically switch ON the motor. When the water level reaches normal level the motor automatically switch OFF. The sensed parameters and current status of the motor will be displayed on user's android application.

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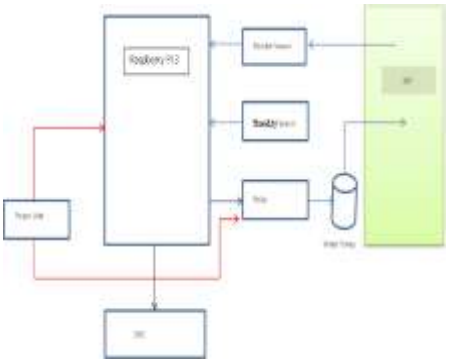

4. HARDWARE REQUIREMENTS

4.1 RASPBERRY PI 3

The Raspberry Pi is a series of small single-board computers. All models feature a Broadcom system on a chip (SoC) with an integrated ARM-compatible central processing unit (CPU) and on-chip graphics processing unit (GPU). Processor speed ranges from 700 MHz to 1.4 GHz for the Pi 3 .

4.2 HUMIDITY SENSOR

Humidity is the amount of water vapour present in air. Water vapour, the gaseous state of water, is generally invisible to the human eye.[1]Humidity indicates the likelihood for precipitation, dew, or fog to be present. The amount of water vapour needed to achieve saturation increases as the temperature increases.

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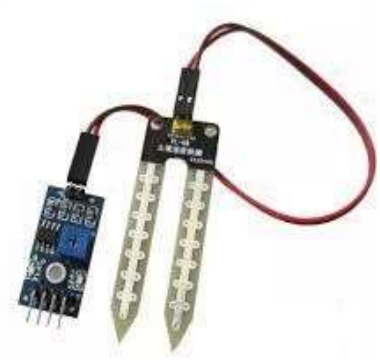

4.3 MOISTURE SENSOR

Soil moisture sensors measure the volumetric water content in soil.[Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content

5. CONCLUSION

From this project, we can control the moisture content of the soil of cultivated land. According to soil moisture, water pumping motor turned on or off via the relay automatically. This saves water, while the water level can be obtained in a preferred aspect of the plant, thereby increasing productivity of crops. Servo motor from vegetation water uniformly dispersed in water, in order to ensure the maximum utilization of absorption through. Thus, there is minimal waste of water. The system also allows the delivery to the plant when needed based on the type of plant, soil moisture, and observed temperature. The project may need to minimize the efforts of major agricultural regions. Many aspects of system can be customized and used software to fine-tune the requirement. our main aim is to reduce the wastage of water.and save money and time for the farmers.

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