Smart Drip Irrigation System using IOT

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***Abstract**: Water is the important source in human life. Around 80 % to 90 % water used in agriculture field. As due to day by day growth in globalization and population water consumption is also increases. Today automation is one of the important roles in agriculture field. Agriculture is the primary occupation in our country. India's major income source is depending on agriculture therefore the development of agriculture is important. In today also most of the irrigation systems are operated manually. The available traditional techniques are like drip irrigation, sprinkler irrigation etc. By the use of Drip Irrigation we can save water and fertilizer provided to the crops. Whenever there is a change in temperature, humidity and current status of rain of the surroundings these sensors senses the change in temperature and humidity and gives an interrupt signal to the raspberry pi. This paper focuses primarily on reducing the wastage of water and minimizing the manual labor on field for irrigation so that you can save time, cash and power of the farmer.*

Key Words: Raspberry Pi, Sensors, Drip Irrigation, automation

1. INTRODUCTION

India is the country of village and agriculture plays an important role for development of country. In our country, agriculture depends on the monsoons which has insufficient source of water. So the irrigation is used in agriculture field. In Irrigation system, depending upon the soil type, water is provided to plant. In agriculture, two things are very important, first to get information of about the fertility of soil and second to measure moisture content in soil. Nowadays, for irrigation, different techniques are available which are used to reduce the dependency of rain. And mostly this technique is driven by electrical power and on/off scheduling. In this technique, water level indicator placed in water reservoir and soil moisture sensors are placed root zone of plant and near the module unit handles the sensor information and transmit data to the controller which in turns the control the flow of water through the valves.

2. LIERATURE SURVEY

In[1] October 2017 .V. Vinoth Kumar, R.Ramasamy, S.Janarthanan, M. VasimBabu anther tells that proposed Irrigation system IoT is implemented, in this system all the information that are received from the sensors and the various parameters are given to the arduinouno microcontroller as an analog input. A preset value of soil moisture sensor is fixed in microcontroller and also for fencing.

In[2] February 2017 ,Srishti Rawal author tells that Automation of farm activities can transform agricultural domain from being manual and static to intelligent and dynamic leading to higher production with lesser human supervision. This paper proposes an automated irrigation system which monitors and maintains the desired soil moisture content via automatic watering. Microcontroller ATMEGA328P on Arduino platform is used to implement the control unit. The setup uses soil moisture sensors which measure the exact moisture level in soil.

In [3] September 2017, Arif Gori, Manglesh author tells about As water supply is becoming scarce in today's world there is an urgency of adopting smart ways of irrigation. The project describes how irrigation can be handled smartly using IOT. This project aims at saving time and avoiding problems like constant vigilance. It also helps in conserving water by automatically providing water to the plants/field depending on the water requirements. This system can also prove to be helpful in agriculture, parks and lawns.

In [4] March 2017, Dr.S.Jothi Muneeswari author tells about automatic irrigation system using the Arduino microcontroller with moisture sensor and water flow management. The humidity sensor unit consists of an Arduino board, Wi-Fi unit, Humidity sensor and water flow control mechanism. The data taken from Humidity sensor will be sending to data monitoring system by arduino boards over a wireless network using WiFi. At Monitoring system, the humidity levels are monitored and any decrease in humidity level below a limit will be reported as requirement for water and signal is raised to the entire humidity sensor unit to open the water flow management. Also, Humidity level in agricultural field can be checked any time through the web portal.

3. PROPOSED SYSTEM

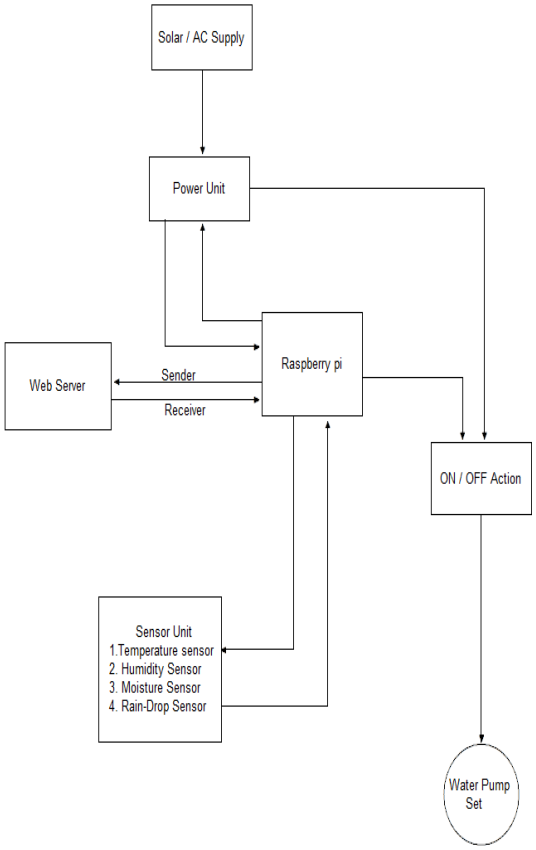


Fig: Block diagram

3.1 DISCRIPTION

In the proposed system first on the AC supply it goes to the power unit then first check action is performed ON or OFF. Suppose action is on then it set the water pump. When action is off the power unit goes to the raspberry pi to perform the action. Then raspberry pi send to sensor for sense the value by using the internet module. Then sensor sense that value and send these value to the raspberry pi. Then raspberry pi send these value to the web server. And then web server compares the throughput value of the sensor and current value which send to raspberry pi. And send these comparable values to raspberry pi then raspberry pi perform the action.

3.2 ADVANTAGES

- Increase in productivity.
- Reduced water consumption.
- No man Power Required.
- Require smaller water sources.

4. FLOWCHART

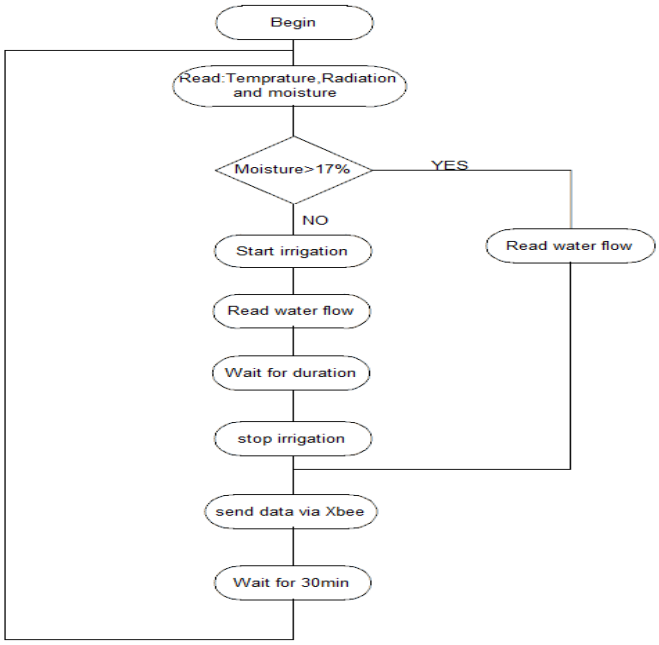


Fig: Flowchart

5. ALGORITHM

Reading Sensor Values.

a. Start the modules to ready mode.
b. Read the sensor value.
c. Store it in the register.

Posting the value to sensor.

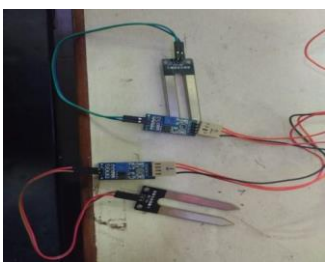
a. Get connected to server.
b. Instruct the Internet module for sending data.
c. Post a sensor value to the server.
d. Store a value in server database.
e. Taking action based on server response.

Take action based on server response.

a. YES- Taking action & continue the reading.
b. NO -Continue reading next sensor values.

6. HARDWARE DETAILS

6.1 Soil Moisture Sensor



Soil Moisture Sensor measures the water content in the soil. In this project the soil moisture sensor is used to manage the irrigation system more efficiently.

6.2 Temperature sensor

Temperature sensor is used to detect the temperature of soil as well as atmosphere.

6.3 Humidity sensor

Humidity sensor is used for sense the humidity in climate.

6.4 Rain drop sensor

Rain drop sensor is used for rain detection. It can be used when raindrop falls. It also measures the rainfall intensity.

6.5 Raspberry pi 3 model B

This is a latest model of raspberry pi. In this model the internet module is in built. Storage capacity of these models is more as compare to old model.

6.6 DC motor pump

DC motor pump is used for pumping the water.

7. CONCLUSION

Automated drip irrigation is the most beneficial approach for the farmers. This system reduces the extra manpower to the farmer for his farm work like supplying water to plants, safeguard the crop from intruders. The smart irrigation system is suitable and cost effective for advance water resources for agricultural production. The system would provide feedback control system which will monitor and control all the activities of plant growth and irrigation system efficiently.

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