

# **SMART FARMING FOR CONTROLLING AND MONITORING IRRIGATION SYSTEM USING INTERNET OF THINGS**

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**Abstract**-This paper is all about the smart irrigation system which is fully automatic and is based on today's emerging technology that is the internet of things. Internet of Things is the network of devices to transfer the information with minimum human involvement. This system consists of different sensors and devices such as moisture sensor, water level sensors, Arduino UNO and GSM Module. which transfer data from one device to another to communicate so that the irrigation system start working automatically. Once the system is configured later there is no much need of farmer involvement is required. Farmer will get notification constantly based on threshold value, such as moisture sensor value and water level value. For example, when the moisture value is less than threshold value the system will start irrigation system and send the notification to the farmer that the system is started or when the water level become low the system start motor to fill water tank and off automatically when it reaches to the max value of water level sensor. This paper ensures the efficient use of water in the irrigation system and improve the productivity.

**Keywords** –IoT(Internet of Things), Irrigation System, Smart Farming,, GSM Module, Arduino UNO.

## **1. INTRODUCTION**

Now a day's there is huge enhancement in technologies which have a significant impact on various fields like agriculture, healthcare etc. 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 system are operated manually. The available traditional techniques are like drip irrigation, sprinkler irrigation etc. These techniques are need to be combined with IoT so that we can make use of water vary efficiently. IoT helps to access information and make major decision making process by getting different values from sensors like soil moisture, water level sensors etc. This paper focuses primarily on reducing the wastage of water and minimizing the manual labor on field for irrigation so that you can saving time, cash and power of the farmer.

## **2. PROPOSED SYSTEM**

The proposed system works automatically based on sensors there for there is no much farmer interaction is involved. Arduino will control the entire system, it will take all sensor values from different sensors such as soil moisture data and water level data, compare them with different threshold values to process and take appropriate action such as to start an irrigation system or to start motor to fill the water tank. Taken action will be send in the form of notifications to the farmer. Today also most of the farmer are using the traditional technique. The traditional technique consumes lots of water, man power and money etc. By using proposed system farmer can monitor and control the system from any place. Where as in the traditional technique farmer has to start or stop manually but in this system starting and stopping of irrigation system and motor is done is automated based on sensors.

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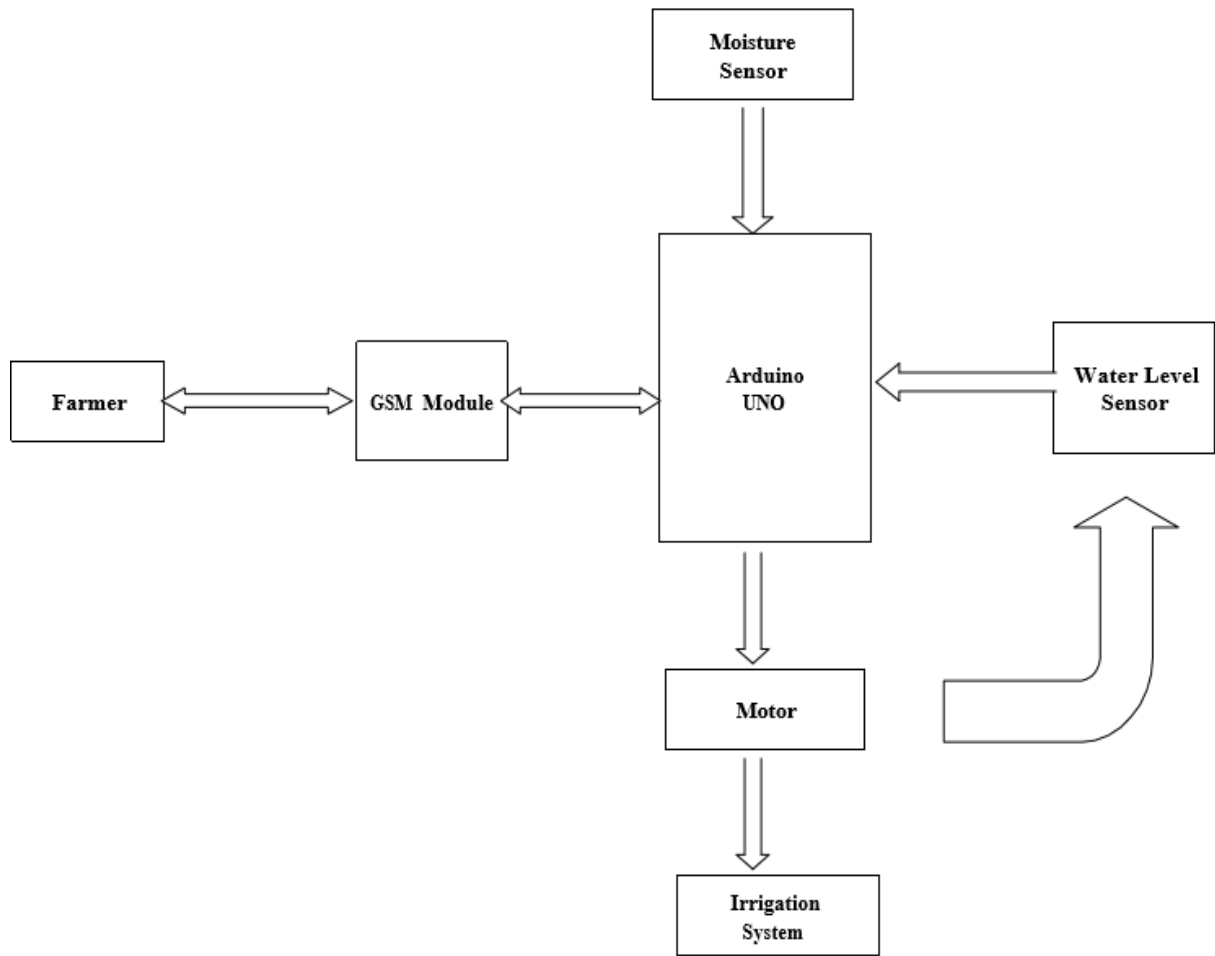


Figure 1. Block Diagram [1]

The system is divided into two sections

1. Sensor section
2. Controller section

Sensor section contains different sensors such as soil moisture sensor and water level sensor. Moisture sensor sends moisture in soil and the water level sensor sends the level of water inside a tank or the water to Arduino. These sensor data are connected to the microcontroller [2].

Control section contains Arduino, GSM module etc. The Arduino UNO is a microcontroller. It is the main component of the system. It controls all connections and acts as a bridge between all devices. GSM stands for global system for mobile communication. A GSM module is a device which can be used to make a microprocessor communicate over a network. A SIM card is required in the GSM module to use it over a network. The received sensor data is compared with the threshold values to take appropriate actions. For example, to start the irrigation system, start the motor to fill the water tank. The controller will notify the farmer.

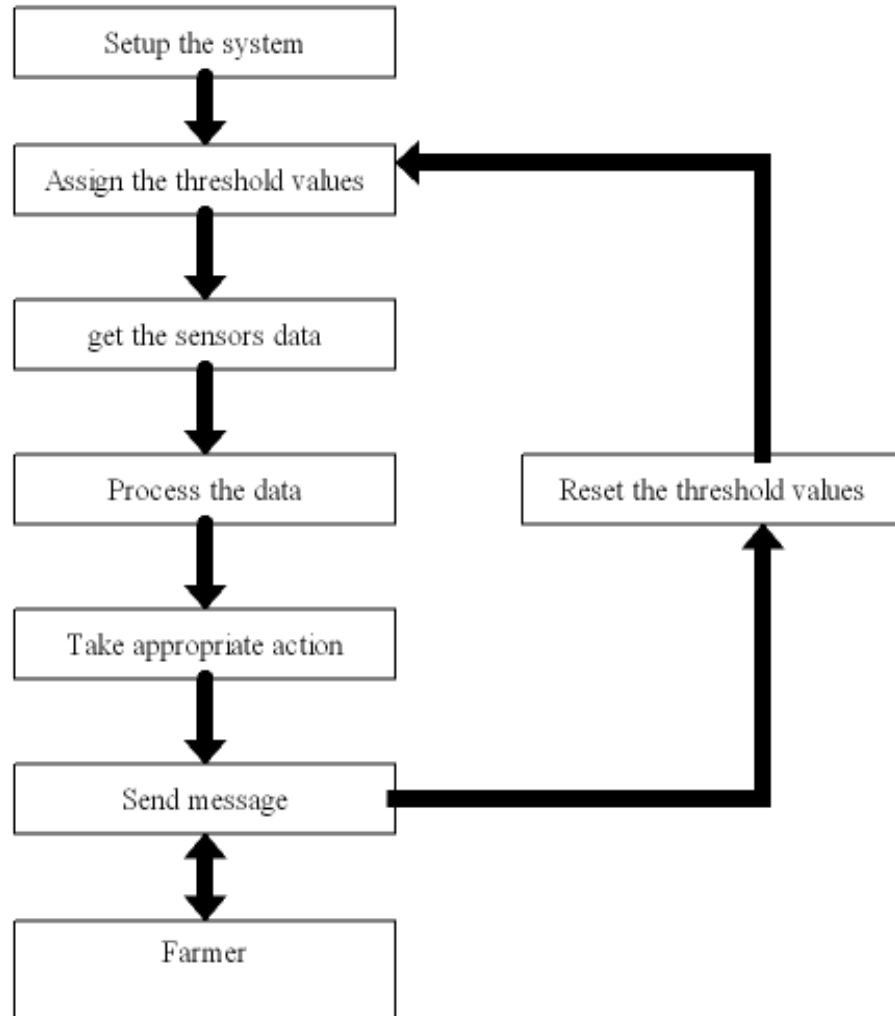


Figure 2. Working Diagram

The system works in following steps.

- The first step is to setting up the entire system or configure the system.
- Assigning the threshold values of soil moisture and water level sensor is done at second step.
- Arduino continuously monitor and get different sensors data from sensor.
- Arduino will process those row data. This is the one of the tedious task in IoT to get meaning full information from the sensor data or row data.
- Take an appropriate action such as starting irrigation system or start motor to fill water tank.
- Notify to farmer about this action.
- Farmer can change the threshold values as it required.

### 3. ELECTRONIC COMPONENTS

#### 3.1 Water Level sensor

The Water level sensor can read the amount of water present in the water tank. It senses the level of water and send the values to the Arduino micro controller [3].

#### 3.2 Moisture sensor

The moisture sensor can read the amount of moisture present in the soil surrounding. It senses the moisture level and send the values to the Arduino micro controller [4].

### 3.3 Arduino Board

The Arduino UNO is a microcontroller. It is the main component of the system. It controls the all connections and acts as a bridge between the all devices.

### 3.4 GSM module

GSM stands for global system for mobile communication. A GSM module is devices which can be used to make microprocessor communicate over a network. A SIM card is required in GSM module to use it over network [5].

## 4.CONCLUSION

This paper is all about the smart irrigation system which is fully automatic and is based on today's emerging technology that is the internet of things. This system is very useful for the regions where the lack of water is the major problem. This paper focuses primarily on reducing the wastage of water and minimizing the manual labor on field for irrigation so that you can saving time, cash and power of the farmer.

## 5. REFERENCES

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