# WIFI MODULE BASED SMART FIELD WATERING

[1]A.SURESH     [2]CH.TEJASWI     [3]K.BHARGAVI     [4]JANNU VENKATARAMANA

[1]ASSISTANT PROFESSOR     [2]STUDENT     [3]STUDENT     [4]STUDENT

[1]Dept. Of Electronics and Communication Engineering,

[1]Malla Reddy Institute of Technology and Science, Hyderabad, Telangana, India.

*Abstract*:-Irrigation is a counterfeit utilization of watering the land for horticultural creation. The prerequisite of water to the dirt relies upon soil properties, for example, soil dampness and soil temperature. Compelling water system can impact the entire development procedure and robotization in irrigation, present day innovation can be utilized to give better results. When all is said in done, the vast majority of the water system frameworks are physically worked. These customary methods can be supplanted with robotized systems of water system so as to use their throughput with computerized procedures of water system so as to utilize the water productively and adequately. Customarily, ranchers will introduce this in their fields to do watering process. By the by, these days ranchers need to deal with their agrarian movement along with different occupations. A Wi-Fi module based smart field watering framework give promising answer for ranchers, where there is no need of the farmer during the watering process.

*Index Terms* - **Soil Moisture Sensor, Temperature Sensor, ESP8266, Arduino Uno, Motor Driver (L293D), Water pump.**

## I. INTRODUCTION

Right now, soil moisture sensor detects the dampness level of the soil. On the off chance that the soil gets dry, at that point the sensor detects low dampness level and consequently turns on the water pump to supply water to the plant. As plant gets adequate water, soil get wet and the engine will be off consequently. Horticulture assumes a significant job in the economy of the world. The whole world relies upon farming for endurance. This is credited to the reality agribusiness fills and as well as satisfies the fundamental human needs. Throughout the years there has been an expansion in the interest for farming creation particularly, considering the expansion in the total population and the need to give nourishment, security in various parts of the world. With the presentation and the progression in the innovation, new cultivating strategies have been presented which are gradually supplanting a portion of the ordinarily utilized conventional techniques for cultivating. This article is a thorough survey of the subject of keen cultivating and how it has affected agriculture .As a rule Smart cultivating is required to conquer any hindrance among enormous and little scope of farmers in both created and creating nations .Mechanical headway, development in the web of things and the presentation of cell phones have contributed tremendously to the adaption of innovation in farming. Obviously shrewd cultivating is the extraordinary cultivating which shows that whenever executed properly can assist farmers with receiving a great deal of rewards including improved yield ,better quality and decreased expense .Anyway such development requires capital, information, and expert aptitudes. You have to join something other than energy for cultivating. Along these lines, the principle reason for the work is to plan the water system framework, which furnishes all the above quality with the customary element accessible in water system frameworks, for example, estimating dampness, investigation of the zone to forestall crop harm issues. Temperature is monitored with the goal that the encompassing temperature can be analysed as the yield temperature is likewise delicate. It has flexibility in controlling the water system framework from anyplace in the Internet accessible world. Additionally, another advantage of this arranged artificial water way framework is that it would give an update of yields and caution the farmer before any negative position comes in the homesteads. It will develop quickly to control and screen the keen water way.

### 1.1  Soil moisture sensor

It is used to gauge the measure of water content in the dirt. Since the direct gravimetric estimation of free soil dampness requires evacuating, drying, and weighing of an example, soil dampness sensors measure the volumetric water content in a soil about way by utilizing some other property of the dirt, for example, electrical opposition, dielectric consistent, or collaboration with neutrons, as an intermediary for the wetness. The connection between the deliberate property and soil dampness must be aligned and may shift contingent upon ecological factors, for example, soil type, temperature, or electric conductivity. Convenient test instruments can be utilized by farmers or plant specialists. Soil sensors regularly allowed to senses that gauge of volumetric water content in the soil. Another class of sensors measures another property of dampness in soils called water potential as appeared in Figure 1.

Figure 1: Soil moisture sensor

### 1.2 DHT11 (Temperature and humidity sensor)

The DHT11(temperature and stickiness sensor) is a crucial, ultra-insignificant exertion automated temperature and tensiometric sensor as showed up in Figure 2. It uses a capacitive sensor and a thermal resistor to check the enveloping air, and gives an automated sign on the data pin (no straightforward data pins required). It's genuinely easy to utilize, yet requires cautious planning to snatch information. The stickiness detecting segment of the DHT11 is a dampness holding substrate with the cathodes applied to the surface. The DHT11 changes over the opposition estimation to relative stickiness on a chip mounted to the rear of the unit and transmits the moistness and temperature readings legitimately to the Arduino UNO.
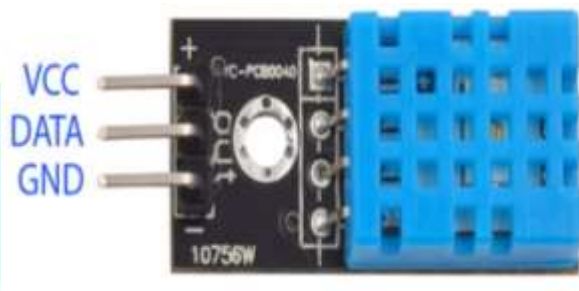


Figure 2:DHT11 Sensor

### 1.3 Arduino Uno

Arduino Uno is an open-source electronic stage dependent on a simple to utilize equipment and programming. It comprises of both the physical programmable circuit board and programming IDE(integrated improvement condition) that sudden spikes in demand for a PC when the program is composed and transferred. It has 14 Data pins and 6 ADC pins. It is a microcontroller board dependent on ATMEGA328 as appeared in Figure 3.



Figure 3: Arduino Uno

### 1.4 ESP8266 (WIFI Module)

It is an independent framework on chip with coordinated TCP/IP convention stack that gives the microcontroller get to the Wi-Fi organize as appeared in Figure 4.The values that are sensed by the dampness sensor and DHT11 are transmitted to the mobile device by using the Wi-Fi module ESP8266.The range of ESP8266 is about 500 meters and the operating frequency is 160MHz.
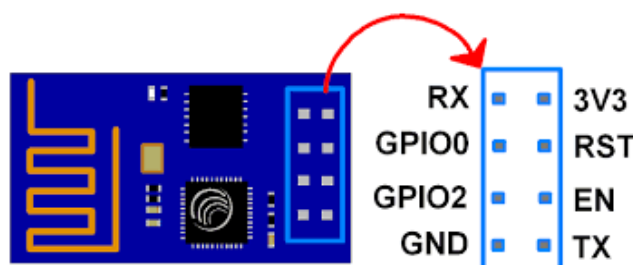


Figure 4: ESP8266 Wi-Fi module

### 1.5 Motor Driver (L293D)

It is a typical motor driver which allows the dc motor to drive in either direction to pump water to the field as shown in Figure 5.It has 16 pins which includes VCC, GND, I/O and enable. It goes about as an interface among engines and the control circuits. Engine requires high measure of current while the controller circuit takes a shot at low current sign. So the capacity of engine driver is to take a low ebb and flow control signal that can drive an engine.



Figure 5:Motor Driver

### 1.5 Water pump

A gadget that moves liquids with power from one spot somewhere else prevalently referred to as siphon as appeared in Figure 6. Siphons serve a wide scope of enterprises and required them as unattractive reason and here we are utilizing this water siphon for the siphoning of water to the field.



Figure 6: Water Pump

### II SYSTEM DESCRIPTION AND RESULT

The majority of the ranchers utilize enormous segment of cultivating land it turns out to be hard to reach and track each edge of huge terrains. This outcome in awful quality harvest yield and budgetary misfortunes .right now shrewd water system framework utilizing the most recent IOT innovation is useful and builds the simplicity of cultivating it has a wide scope to automate the complete irrigation system. Here we are building a system which is completely dependent on the wireless transformation of the data through the medium and dht11. This won't just naturally inundate the product dependent on the dampness level in the dirt yet in addition sense the information to the application the framework will comprise of soil dampness sensor, temperature and mugginess sensor, WIFI module, engine driver, water siphon. The worth detected by the dampness sensor and dht11 that are interfaced to the Arduino board will be shown on the portable through the WIFI module. Depending on these qualities the engine driver turns the engine ON and the water siphon siphons the water to the field. At the point when the field is wet the engine driver off the engine and the water is halted from being siphoned as appeared in the Figure 8 equipment unit. Through this strategy water can be utilized imprudent way.
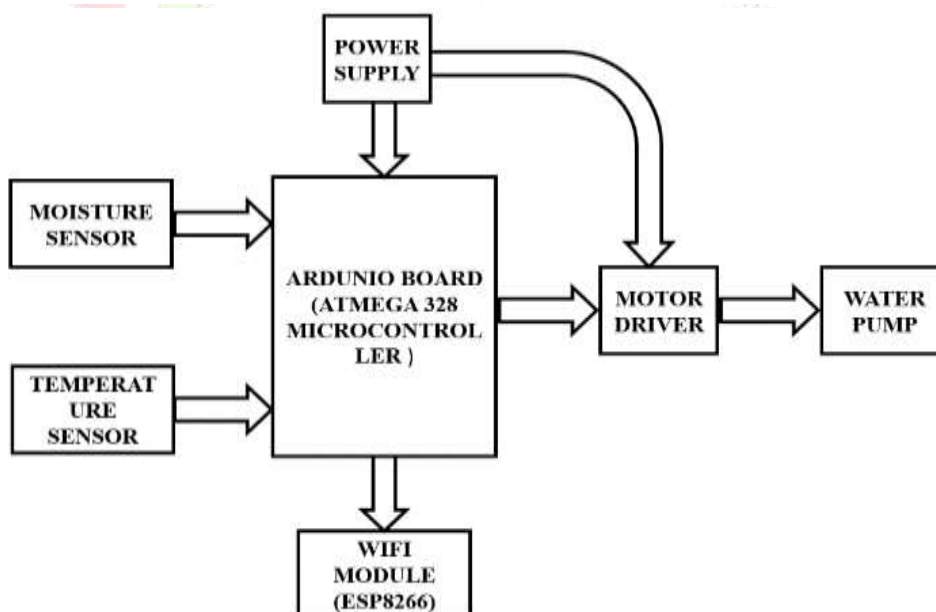


Figure 7: Block Diagram

Steps to follow

1. First the connections have to be made accordingly block diagram and a connector is used to connect the Arduino and pc as shown in Figure 7.

2. Soil moisture sensor and DHT11 are interfaced to the Arduino board. The soil moisture sensor is placed in the soil. If the soil is dry then according to the user programme the microcontroller send information to the motor driver to enable the motor to switch ON.

3. The values sensed by the soil moisture sensor and the temperature sensor, humidity values are transmitted to the mobile or PC by entering a virtual IP address of Wi-Fi module (ESP8266).

4. Depending upon the values obtained the field is watered.

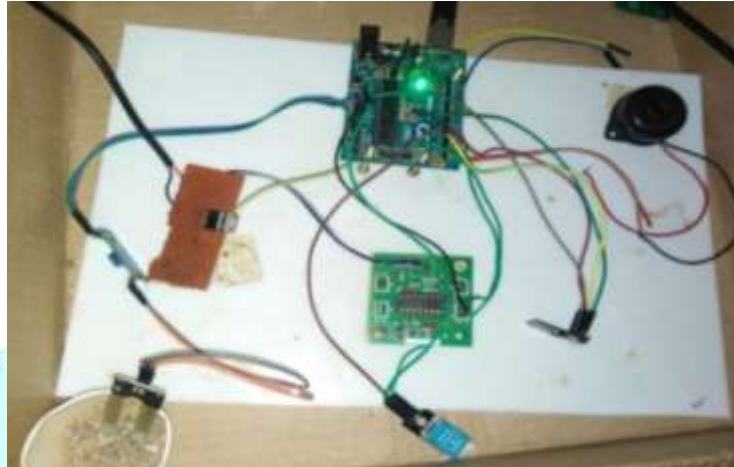5. The output obtained as follows as Figure 9.
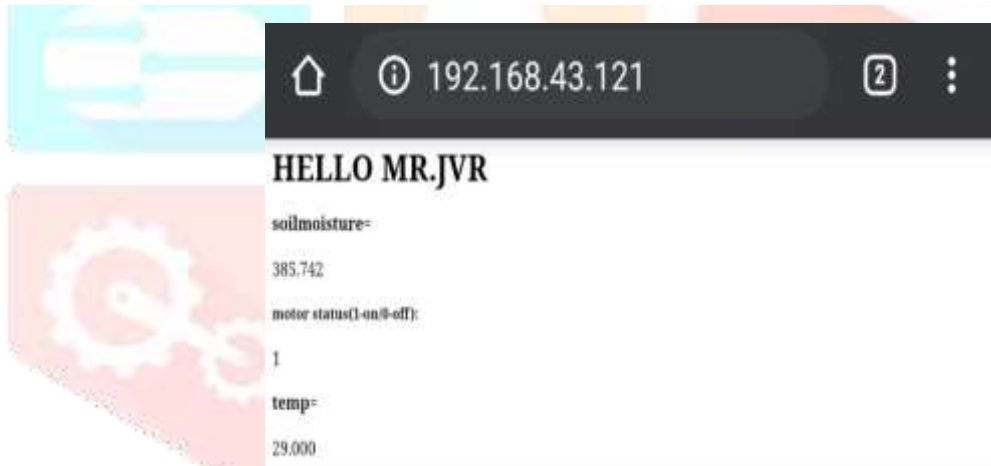


Figure 8:Hardware kit



Figure 9 :Mobile phone display the status of the system

## III CONCLUSION

The Wi-Fi module based brilliant field watering framework ends up being an ongoing input framework which screens and controls all exercises of watering the documented effectively. The present proposition is a model to modernize the agribusiness businesses at a mass scale with ideal use. Utilizing this framework, one can spare labour, water to improve creation and at last benefit.

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