PROJECT 6

Soil Moisture sensor using webserver

1.INTRODUCTION:-

We all have home gardens at our home. To keep the plants more healthy, we need to water the plants at perfect time at perfect range.

Using this Soil moisture sensor with the IOT Technology, You can be able to know the soil moisture and get notification through your Smart phone. When the Soil get enough moisture, you can stop watering your plants.\

Through out this Activity you can prevent your plants from excess watering and keep the Soil Moisture from falling into dry condition.

COMPONENTS:-

1. **WEMOS**
2. **SOIL MOISTURE**

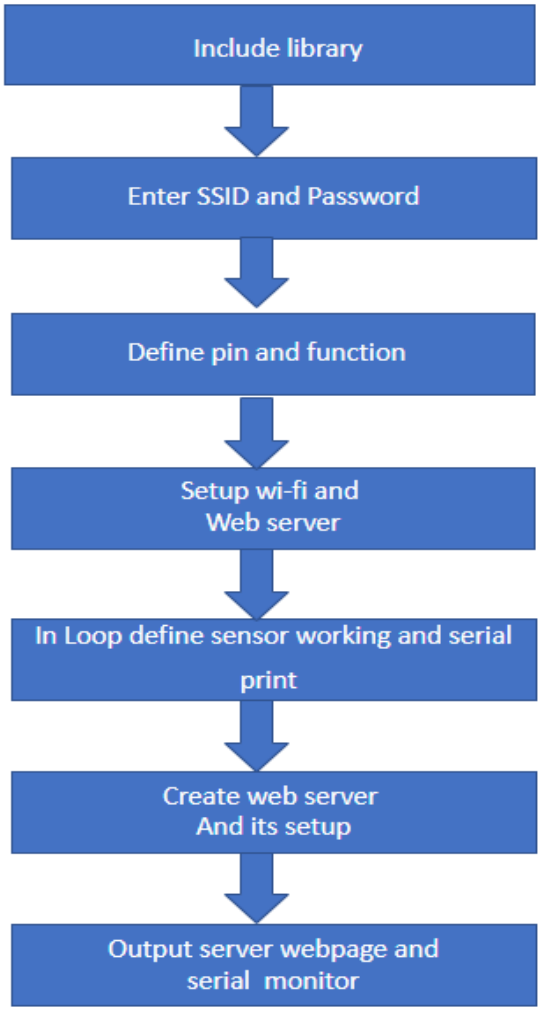
APPLICATION:-

Soil moisture sensors are used in numerous research applications, e.g. in agricultural science and horticulture including irrigation planning, climate research, or environmental science including solute transport studies and as auxiliary sensors for soil respiration measurements.

OBJECTIVES:-

Soil moisture sensors measure the water content in the soil and can be used to estimate the amount of stored water in the soil horizon. Soil moisture sensors do not measure water in the soil directly. Instead, they measure changes in some other soil property that is related to water content in a predictable way.

FLOW CHART :-


Include library
Enter SSID and Password
Define pin and function
Setup wi-fi and
Web server
In Loop define sensor working and serial
print
Create web server
And its setup
Output server webpage and
serial monitor

HARDWARE CONNECTION:-

1. Connect pin sensor to wemos
2. Connect pin GND to GNG
3. Connect pin 5V to 5V
4. Connect pin D0 to D8

Programming:-

```
#include <ESP8266WiFi.h>

const char* ssid = "Your SSID";
const char* password = "Your Wifi Password";

int Raw       = A0;      //Analog channel A0 as used to measure temperature
int threshold = 13;      //Nodemcu digital pin water sensor read
WiFiServer server(80);

void setup() {
  Serial.begin(115200);
  delay(10);
  // Connect to WiFi network
  pinMode(threshold,INPUT_PULLUP); //Pin#13 as output-Activate pullup at pin 13
  Serial.println();
  Serial.print("Connecting to ");
  Serial.println(ssid);

  WiFi.begin(ssid, password);     //Begin WiFi

  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");

  // Start the server
  server.begin();
  Serial.println("Server started");

  // Print the IP address on serial monitor
  Serial.print("Use this URL to connect: ");
  Serial.print("http://");    //URL IP to be typed in mobile/desktop browser
  Serial.print(WiFi.localIP());
  Serial.println("/");

}
```

```
void loop() {
  // Check if a client has connected
  WiFiClient client = server.available();
  if (!client) {
    return;
  }

  // Wait until the client sends some data
  Serial.println("new client");
  while(!client.available()){
    delay(1);
  }

  // Read the first line of the request
  String request = client.readStringUntil('\r');
  Serial.println(request);
  client.flush();

  // Match the request
  float percentage = 0.0;
  int value = LOW;
  if (request.indexOf("/Up=ON") != -1)  {
      //Analog pin reading output voltage by water moisture rain sensor
       float reading = analogRead(Raw);
       percentage = (reading/1024) * 100;   //Converting the raw value in percentage
    value = HIGH;
  }


  // Return the response
  client.println("HTTP/1.1 200 OK");
  client.println("Content-Type: text/html");
  client.println(""); //  do not forget this one
  client.println("<!DOCTYPE HTML>");
  client.println("<html>");
  client.println("<h1 align=center>Rain Soil Water moisture Level</h1><br><br>");
  client.print("Moisture Level Percentage =");
  client.print(percentage);
  client.print("%");
  client.println();

if(digitalRead(threshold)==HIGH){
  client.println("Threshold Reached = Rain detected / Moisture exceeded / Water detected");
  }

  if(value == HIGH) {
    client.println("Updated");
  } else {
    client.print("Not Updated");
  }
  client.println("<br><br>");
  client.println("<a href=\"/Up=ON\"\"><button>Update Moisture Level</button></a><br />");
  client.println("</html>");
  delay(1);
  Serial.println("Client disonnected");
  Serial.println("");

}
```

Circuit Diagram:-