GOVERNMENT COLLEGE OF ENGINEERING ERODE

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Government College of Engineering, Erode
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

B.E Electronics and Communication Engineering

SMART PLANT MONITORING BY WATER MANAGEMENT SYSTEM

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INTRODUCTION:

Smart plant monitoring by water management systems involves the use of advanced technologies to efficiently and effectively manage water resources for plant growth in various agricultural and horticultural settings. These systems integrate sensors and automation to optimize water usage, conserve resources, and enhance crop yield and quality. Here are some existing ideas and components commonly found in smart plant monitoring systems for water management.

CODING:

```
//Include the library files

#define BLYNK_TEMPLATE_ID "TMPL3RpinReNQ"

#define BLYNK_TEMPLATE_NAME "smart plant monitoring"

#define BLYNK_AUTH_TOKEN "n_U0uPZSqA2_tr9C-ZfWBK7HDn6c0zch"

#include <LiquidCrystal_I2C.h>

#define BLYNK_PRINT Serial

#include <ESP8266WiFi.h>

#include <BlynkSimpleEsp8266.h>

#include <DHT.h>


//Initialize the LCD display

LiquidCrystal_I2C lcd(0x3F, 16, 2);


char auth[] = "n_U0uPZSqA2_tr9C-ZfWBK7HDn6c0zch";  //Enter your Blynk Auth token
```

```
char ssid[] = "Redmi 9 Prime";  //Enter your WIFI SSID

char pass[] = "subi2423";  //Enter your WIFI Password


DHT dht(D4, DHT11);//(DHT sensor pin,sensor type)  D4 DHT11 Temperature Sensor

BlynkTimer timer;


//Define component pins

#define soil A0     //A0 Soil Moisture Sensor

#define PIR D5      //D5 PIR Motion Sensor

int PIR_ToggleValue;


void checkPhysicalButton();

int relay1State = LOW;

int pushButton1State = HIGH;

#define RELAY_PIN_1       D3    //D3 Relay

#define PUSH_BUTTON_1     D7    //D7 Button

#define VPIN_BUTTON_1    V12


//Create three variables for pressure

double T, P;

char status;
```

```
void setup() {
  Serial.begin(9600);
  lcd.begin();
  lcd.backlight();
  pinMode(PIR, INPUT);

  pinMode(RELAY_PIN_1, OUTPUT);
  pinMode(PUSH_BUTTON_1, INPUT_PULLUP);
  digitalWrite(RELAY_PIN_1, relay1State);
  Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);
  dht.begin();

  lcd.setCursor(0, 0);
  lcd.print(" Initializing ");
  for (int a = 5; a <= 10; a++) {
    lcd.setCursor(a, 1);
    lcd.print(".");
    delay(500);
  }
  lcd.clear();
```

```
  lcd.setCursor(11, 1);
  lcd.print("W:OFF");
  //Call the function
  timer.setInterval(100L, soilMoistureSensor);
  timer.setInterval(100L, DHT11sensor);
  timer.setInterval(500L, checkPhysicalButton);
}


//Get the DHT11 sensor values
void DHT11sensor() {
  float h = dht.readHumidity();
  float t = dht.readTemperature();

  if (isnan(h) || isnan(t)) {
    Serial.println("Failed to read from DHT sensor!");
    return;
  }
  Blynk.virtualWrite(V0, t);
  Blynk.virtualWrite(V1, h);

  lcd.setCursor(0, 0);
```

```
  lcd.print("T:");
  lcd.print(t);

  lcd.setCursor(8, 0);
  lcd.print("H:");
  lcd.print(h);

}

//Get the soil moisture values
void soilMoistureSensor() {
  int value = analogRead(soil);
  value = map(value, 0, 1024, 0, 100);
  value = (value - 100) * -1;
  if(value < 40){
    digitalWrite(RELAY_PIN_1,LOW);
  }
  else if(value >= 80){
    digitalWrite(RELAY_PIN_1,HIGH);
  }

  Blynk.virtualWrite(V3, value);
```

```
  lcd.setCursor(0, 1);
  lcd.print("S:");
  lcd.print(value);
  lcd.print(" ");

}

//Get the PIR sensor values
void PIRsensor() {
  bool value2 = digitalRead(PIR);
  if (value2) {
    Blynk.logEvent("PIRMOTION","WARNING! Motion Detected!"); //Enter your Event Name
    WidgetLED LED(V5);
    LED.on();
  } else {
    WidgetLED LED(V5);
    LED.off();
  }
  }

BLYNK_WRITE(V6)
{
```

```
 PIR_ToggleValue = param.asInt();
}


BLYNK_CONNECTED() {
  // Request the latest state from the server
  Blynk.syncVirtual(VPIN_BUTTON_1);
}

BLYNK_WRITE(VPIN_BUTTON_1) {
  relay1State = param.asInt();
  digitalWrite(RELAY_PIN_1, relay1State);
}

void checkPhysicalButton()
{
  if (digitalRead(PUSH_BUTTON_1) == LOW) {
    // pushButton1State is used to avoid sequential toggles
    if (pushButton1State != LOW) {

      // Toggle Relay state
      relay1State = !relay1State;
```

```
      digitalWrite(RELAY_PIN_1, relay1State);

      // Update Button Widget
      Blynk.virtualWrite(VPIN_BUTTON_1, relay1State);
    }
    pushButton1State = LOW;
  } else {
    pushButton1State = HIGH;
  }
}


void loop() {
    if (PIR_ToggleValue == 1)
    {
    lcd.setCursor(5, 1);
    lcd.print("M:ON ");
      PIRsensor();
      }
     else
     {
    lcd.setCursor(5, 1);
```

```
    lcd.print("M:OFF");
    WidgetLED LED(V5);
    LED.off();
     }

if (relay1State == HIGH)
{
  lcd.setCursor(11, 1);
  lcd.print("W:ON ");
  }
  else if (relay1State == LOW)
  {
    lcd.setCursor(11, 1);
    lcd.print("W:OFF");
   }


  Blynk.run();//Run the Blynk library
  timer.run();//Run the Blynk timer

  }
```

CONDITION:

If the moisture level goes below 40 percentage the relay gets on and also the pump gets to work and if the moisture value is greater than or equal to 80 percentage then the relay will off and it turns off the pump.

CONCLUSION:

The smart plant monitoring by water management systems leverages technology to optimize water usage, increase crop yields, and promote sustainable agriculture. These systems combine various sensors and control mechanisms to efficiently manage water resources while considering plant needs and environmental factors.