PAPER TITLE :- IoT-Enabled Smart Drip Irrigation System Using ESP32

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PROBLEM MENTIONED/SOLUTION OBTAINED:-

The paper presents a Smart Drip Irrigation System for precision agriculture, addressing the issue of efficient and automated water management in agriculture. The solution obtained is an IoT-enabled system that automates irrigation based on soil moisture, temperature, and humidity, optimizing water usage for plant growth.

ALGORITHM USED:- None

TOOLS USED/IMPLEMENTED:-

Microcontroller: ESP32

Moisture Sensor: DFRobot SEN0308

Temperature Sensor: DS18B20

Air Humidity Sensor: DHT22

Water Flow Sensor: FS300A G3/4 Inch

Solenoid Valve: Hunter PGV-100G (24VAC)

Relay: Used as an electrically controlled switch

Step-Down Voltage Regulator: To supply power to the ESP32

Acrylic Container: Custom-made for housing the system

Soil: All-purpose potting soil with specific characteristics

Various containers and enclosures: To protect components from dust and water

Blynk IoT Dashboard: Used for monitoring and controlling the system

RESULTS AND DISCUSSION:-

Primary tests in the laboratory validated the functionality of the moisture sensor, temperature sensor, air humidity sensor, water flow sensor, solenoid valve, and firmware.

Comparing sensor readings to weather forecasts demonstrated that the sensors provided accurate measurements, especially in air temperature and humidity.

Testing the solenoid valve outdoors proved that the system could work effectively in an outdoor environment.

Testing the entire smart drip irrigation system in the field showcased successful growth of spring onions while ensuring adequate water supply and automated irrigation based on sensor readings.

KNOWLEDGE AQUIRED:-

The paper provides insights into building an IoT-enabled smart drip irrigation system for precision agriculture, emphasizing automation and control using a microcontroller. It also discusses calibration, sensor validation, and field testing. The system offers real-time monitoring and control through a Blynk IoT dashboard.

IMPORTANT REFERENCE:-