**PAPER TITLE :-** IoT-Enabled Smart Drip Irrigation System Using ESP32 **DATE:-** 7 July 2023

**JOURNAL/CONFERENCE:- MDPI**

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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:-**