Smart Agriculture Monitoring and Automated Irrigation System Using IoT

Prof. Palwe Priyanka D[1], Atharva Santosh Ubale[2], Piyush Mahalu Shipankar[3],
Jagruti Bharat Shinde[4] Gaikwad Piyush Balkisan[5] Pravin Balu Meher[6]

Prof, Department of Computer, Sau Sundarbai Manik Adsul Polytechnic, Ahilyanagar[1].
Student, Department of Computer, Sau Sundarbai Manik Adsul Polytechnic, Ahilyanagar[2,3,4,5,6]

Abstract: *Agriculture requires efficient water management and real-time monitoring to improve crop productivity. This paper presents a Smart Agriculture Monitoring and Automated Irrigation System using Internet of Things (IoT) technology. The system uses sensors for soil moisture, temperature, humidity, rainfall, and light intensity, integrated with an ESP32 microcontroller. Sensor data is sent to a local Python server (Flask API) for processing and then stored in a MySQL database. A web application dashboard retrieves data through REST APIs for real-time visualization and remote monitoring.*
Based on threshold values, the system automatically controls a water pump through a relay module and stops irrigation during rainfall. Manual motor control and alert notifications are also supported. The proposed system reduces water wastage, minimizes human effort, and provides a scalable solution for precision agriculture.

Keywords: *Smart Agriculture, Internet of Things (IoT), Automated Irrigation, ESP32, Soil Moisture Sensor, DHT11, Rain Sensor, LDR, Python Server, MySQL, Web Dashboard, Precision Farming*