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IoT-Based Smart Irrigation System

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Abstract: *Efficient irrigation management is essential for improving agricultural productivity and conserving water resources. In many agricultural areas, irrigation is still performed manually without checking the real-time condition of the soil. This often results in excessive water usage, uneven crop growth, and increased labor effort. The proposed IoT-Based Smart Irrigation System automates irrigation by continuously monitoring soil moisture levels using sensors connected to a NodeMCU ESP8266 microcontroller. The system also monitors temperature and humidity to estimate possible rainfall conditions and avoid unnecessary watering. A separate fertilizer pump is integrated to provide nutrient control when required. All system parameters are monitored and controlled remotely through the Blynk IoT cloud platform. The developed system helps in conserving water, reducing manual intervention, and improving overall crop health through intelligent automation.*

Keywords: IoT, Smart Irrigation, NodeMCU ESP8266, Soil Moisture Sensor, Rain Prediction, Fertilizer Control, Automation

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