

# Smart Agriculture System for Efficient Irrigation and Crop Recommendation

**Dr. Kiran YC, Deepashree V, Dhanush B, Harshini GR, Riya S Nadig**

Department of Information Science and Engineering  
Global Academy of Technology Bengaluru, Karnataka, India

**Abstract:** *A smart agriculture monitoring and control system has been developed using NodeMCU ESP8266 and the Blynk platform to assist farmers with real-time environmental updates and crop recommendations. The system integrates multiple sensors including soil moisture, DHT11 (temperature and humidity), rain sensor, PIR motion detector, and pH sensor. When the soil is detected as dry, the water pump is activated automatically, whereas rainfall detection halts irrigation to prevent excess watering. Additionally, the PIR sensor alerts the farmer via the Blynk app when motion is detected near the field. The pH sensor plays a key role in determining the soil's acidity or alkalinity levels. By comparing these readings with established agricultural data, the system suggests a list of crops that are best suited for the current soil condition, helping farmers make informed decisions. This feature not only improves crop yield but also minimizes the risk of crop failure due to unsuitable soil chemistry. The integration of an I2C LCD display provides on-site monitoring, while real-time data is also transmitted to the Blynk mobile application for remote access.*

**Keywords:** Internet of Things, Agriculture, Smart Plant Monitoring, NodeMcu ESP8266, Blynk

