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Smart Greenhouse Monitoring and Control System using sensors, IoT and Solar Power

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Abstract: *This project presents the design and development of a smart greenhouse system that integrates sensor, IoT technology, and solar power to create an ESP8266 microcontroller, which collects real-time data from sensor including soil moisture, temperature and humidity (DHT11), and light intensity (LDR). Based on these readings, the system automatically activates devices such as a water pump for irrigation, a fan for ventilation, and LED light to maintain optimal lighting conditions. This project's primary power source is a solar panel, which is backed by a battery to guarantee continuous functioning. Additionally, the system allows users to monitor environmental conditions and control components but also enables better decision-making for plant care. The project aims to reduce manual intervention, conserve resources like water and electricity energy. The result is a reliable, low-maintenance, and eco-friendly solution suitable for both small-scale and remote agricultural applications*

Keywords: Smart Greenhouse, IoT-based Agriculture, Solar-power system, Environmental Monitoring

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