

Optimizing an IoT-Based Greenhouse Remote Monitoring System for Sustainable Agriculture in Sri Lanka

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This research endeavours to optimize an IoT-based greenhouse remote monitoring system for sustainable agriculture in Sri Lanka by leveraging IoT technology to enhance productivity and sustainability. The methodology involves a multifaceted approach that integrates a comprehensive review of global IoT-based greenhouse monitoring systems with an immersive exploration of greenhouses across Sri Lanka. To gather real-time data on environmental parameters, including temperature, humidity, soil moisture, and light levels, sensors are strategically deployed within the greenhouses. The deployment involves placing sensors at key locations to capture variations in these parameters, ensuring a representative dataset. The frequency of data collection is set at regular intervals, capturing diurnal and seasonal variations. These intervals are determined based on the specific needs of Sri Lankan crops and local climate conditions, optimizing the relevance of the collected data. The collected datasets from various agricultural settings undergo meticulous comparison with global research datasets. This comparison forms the basis for identifying gaps in knowledge and discerning the most suitable IoT solutions for Sri Lanka's greenhouse ecosystem. Additionally, the research explores global IoT-based greenhouse monitoring systems, utilizing real-time data obtained from Sri Lankan greenhouses. The detailed insights gained from this study enable the selection and customization of IoT solutions tailored to Sri Lanka's agricultural environment, with a focus on improved greenhouse management. By aligning global advancements with local needs and employing specific methods such as strategic sensor deployment and optimized data collection frequencies, this research contributes to the advancement of sustainable and technologically sophisticated agriculture in Sri Lanka.

Keywords: *IoT; IoT Greenhouses; Smart greenhouse; Smart agriculture*