

Research on the Contiki open-source operating system for wireless sensor networks and its application in precision agriculture systems in Laos.

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Abstract: This study investigates the Contiki open-source operating system for wireless sensor networks (WSNs) and its application in precision agriculture systems in Laos. Given the critical need for efficient resource management in Lao agriculture, WSNs offer a viable solution for real-time environmental monitoring. Contiki, renowned for its lightweight design and support for constrained devices, is evaluated for its suitability in this context. The research focuses on the implementation of Contiki-based sensor nodes to monitor key parameters such as soil moisture, temperature, and humidity. Through experimental deployment in a Lao agricultural setting, the study assesses network performance, energy efficiency, and data reliability. Results demonstrate that Contiki provides a robust and energy-efficient platform for WSNs, enabling precise data collection and transmission. The findings highlight the potential of this open-source system to enhance crop yield and resource optimization, offering a scalable and cost-effective framework for modernizing agricultural practices in developing regions like Laos.

Keywords: Contiki, wireless sensor network, precision agriculture, open source