Applications of Wireless Sensor Networks and Object Detection in Precision Agriculture: A Review

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Abstract.   Sri Lanka is a country with a good background in crop cultivation. In ancient times, the only occupation available for most citizens was cultivation. With the economic issues, cultivation is going down the stream. Automating the agricultural process will develop the country's economy as well as the life patterns of the citizens. This research aims to study the existing systems developed using WSN and identify the best technologies and sensors for a WSN to be developed to facilitate large farms in Sri Lanka. This study was conducted under two main topics: 'wireless sensor networks in agriculture' and 'other technologies used in agricultural as well as for object detection'. A systematic literature review is conducted to review the existing technologies. From the collected research work, the most important research papers were selected by reading the abstracts and the introduction. Most of the WSNs were developed with the ZigBee protocol as it is the most recent and easily scalable protocol out of the available protocols. Sensors were used to detect light, temperature and humidity. Few research studies were embedded with an expert system to provide expert decisions for the farmers regarding their cultivation. Cameras were deployed in the sensor nodes to capture images of the field. This review study concludes that the Atmega128L is the most suitable controller of the node, along with the ZigBee protocol and other sensors. Furthermore, DTE is the best algorithm for object classification and detection.

Keywords: *Wireless Sensor Network (WSN), Precision Agriculture, Image Processing, Agriculture, Object Detection*