

ABSTRACT

For continuous observation of rice plants on the influence of climate on rice plants in the vegetation stage, reproductive stage, the ripening stage through measuring pH, temperature, soil moisture using Wireless Sensor Network (WSN) technology. The purpose of this study is to monitor the influence of climate on the growth of rice plants with Wireless sensor network (WSN) technology, then proposed the design and implementation of zigbee platform and Arduino-based WSN with observation methods including monitoring indicator changes for each sensor node, distance parameters, delay parameters for each growth rice. WSN performance testing through RSSI (receive signal strength indicator) parameters between end devices and coordinators through the XCTU software application is carried out at each stage of rice growth. Test results at a distance of 100 meters obtained the average value of RSSI at the vegetative stage of -80.40 dBm, at the reproductive stage of -83.72 dBm, and at the Ripening stage of -84.44 dBm. Testing the WSN implementation using cluster tree topology is done at different times. The test is carried out between sensor nodes to the coordinator node in the cluster tree topology in different areas. The measurement results of data transmission delay is 312ms for an area of 1 hectare of rice at 120 days of rice with 7 units of nodes. Furthermore, with the number of 7 units of nodes, 376ms is obtained for rice fields with an area of 2 hectare, at 120 days of rice. The results of the WSN implementation experiment on a 2 hectare rice farming area can provide real-time information so as to contribute to agriculture when climate conditions change or sudden pest attacks that have an impact on rice crop productivity and food security.

Keywords: *WSN, Zigbee Platform, Arduino, Topologi cluster tree, RSSI.*