PROTOTYPE OF RICE FIELD IRRIGATION MONITORING SYSTEM USING WIRELESS SENSOR NETWORK INTEGRATED WITH TELEGRAM APPLICATION

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ABSTRACT

Rice production depends on the provision of nutrients and proper watering of rice plants. Proper watering can help the growth of rice plants more optimally. Optimal rice plant growth has a positive impact on crop yields. Therefore, in this study, a rice field irrigation monitoring system was designed to monitor the condition of the height of water puddles in rice fields which can be done through the Telegram application using the Wireless Sensor Network. There is a slave node as a transmitter to measure the height of water puddles using an ultrasonic sensor and soil moisture in rice plants using a soil moisture sensor. In addition, there is a master node as a receiver to receive the results of measuring the height of water puddles and soil moisture in rice plants. The results of the research that has been carried out, the rice field irrigation monitoring system that has been created shows the results of ultrasonic sensor testing on slave node A with a percentage of error value of 2.40%, on slave node B with a percentage of error value of 3.48% and soil moisture sensor testing on slave node A with a percentage of error value of 4.24% and soil moisture sensor testing on slave node B with a percentage of error value of 3.31%. In the Wireless Sensor Network test using the NRF24L01 wireless communication module, it shows that the time received for sending sensor data is less than 2 seconds with a maximum distance of the slave node to the master node of 74 meters at the test location in the rice field area. Then, the results of the Telegram Chat Bot study were able to send notifications of water level conditions and soil moisture with a notification delivery time of less than 10 seconds when the rice field condition request command was requested.

***Keywords**: Irrigation, Wireless Sensor Network, Telegram Chat Bot*