

## **ABSTRACT**

*The transition season greatly affects water quality such as pH, temperature, and water turbidity so that it can cause tilapia cultivation to be disrupted and even experience harvest failure. When it suddenly rains, the pH of the water will drop and cause the death of tilapia because it is not anticipated by farmers. Monitoring of water quality in Nganjat village is still done manually so it cannot be monitored in real time.*

*Technological developments can solve the problem that occurs, namely the implementation of a water quality monitoring system in the Ponggok River using LoRa as a failure mitigation in tilapia ponds in Nganjat Village. The system consists of temperature, pH, and turbidity sensors installed at three points of the river flow with solar panel power supply and the use of LoRa communication for data transmission. The use of LoRa communication is intended to avoid the need for internet access at every point due to the difficulty of internet access at the location and to save costs. In addition, solar panels were chosen as a power supply so that people do not have to pay for battery or electricity replacement. The expected output in this final project is that data can be sent in real time every five minutes and the system can work well.*

*From this final project, the percent error of the pH sensor is 1.82%, the turbidity sensor is 4,12%, and the temperature sensor is 0.459%. Delivery delay from node 1 to gateway is 142.9 ms with RSSI -107.3 and delivery delay from node 2 to gateway is 155.8 ms with RSSI -114.5. The delay in sending node 1 from the gateway to the database is 106.6, and the delay in sending node 2 from the gateway to the database is 87.32 s, and the delay in sending node 3 to the database is 41.3 s.*

**Keywords:** *water quality, realtime, LoRa, sensor*