

ABSTRACT

Freshwater lobster cultivation is strongly influenced by water quality, that is the pH level of the water and the water temperature in the freshwater lobster cultivation pond. The pH level and water temperature must be kept stable at a pH of 6-8 and a temperature of 20°C-31°C. However, monitoring of water quality is currently still done manually, causing a lack of time efficiency in the cultivation of this freshwater lobster. Especially during the transition season, where the weather changes erratically. This greatly affects the pH level and water temperature which must be kept stable by monitoring it regularly.

This study aims to design a water quality monitoring system in freshwater lobster ponds, so that the water quality monitoring process can run efficiently. The monitoring process is carried out by using the LoRa network as a remote communication system. So that freshwater lobster breeders do not need to come directly to the cultivation pond to check water quality. This monitoring can be programmed at the desired time automatically and can be monitored in real-time. Design a communication system based on the Internet of Things (IoT). Sensor data from nodes is sent to the gateway and then forwarded to the IoT Cloud Platforms.

The results of the test show that the accuracy of the sensor is above 99% with temperature sensor error value 0.022% and pH sensor error value 0.012%, concluded that the sensor is good for use. In the communication system, distance testing is carried out at NLoS for the value of throughput, delay, packet loss in densely populated places. Communication is successful on LoRa between the node and the gateway at a NLoS distance of 750m. The data received by the gateway is successfully monitored on Thingspeak in real-time.

Keywords: *Freshwater crayfish, Water Quality, IoT, LPWAN, IoT Cloud Platforms.*