

ABSTRACT

Indonesia is a country that has a huge potential in fisheries, especially in the field of aquaculture. Maintenance of water quality is crucial to maintaining and increasing productivity. The method that has been carried out in checking water quality is to take sample and testing it in the laboratory. This method can costs a lot of money and time. The solution to this problem is to create a device that can monitor water quality in fish ponds that are being cultivated in real time. Users can find out the condition of the water quality that is being monitored anytime and anywhere.

To solve this problem, a real-time water quality monitoring system is designed. By selecting several parameters for water quality, users can find out the condition of water quality. In this research, Arduino Uno was chosen as the main controller of the system. pH, temperature, turbidity, and Total Dissolved Solids (TDS) will be selected as parameters of water quality. Fuzzy Logic with Sugeno method will be used as an assessment of the four parameters to determine water quality conditions. The results of the whole system will be displayed on the *ThingSpeak* IoT platform using the Wi-Fi communication module.

The test results show all sensor parameters have an accuracy value of >97% with a relatively low error value of <3%. System testing has been carried out for 7 days of monitoring and gives pretty good results when compared to digital sensors. The Fuzzy Logic which is designed to provide the output of water quality conditions has an error value of 1.93%. The delay (s) obtained by the system to send data to *ThingSpeak* is 3.43 s. This system can make it easier for users to monitor water quality for aquaculture in real-time so as to increase fish productivity.

Keywords: aquaculture, water parameters, fuzzy logic, real-time