

ABSTRACT

Koi fish (Cyprinus carpio) is a type of ornamental fish that is greatly influenced by the quality of the surrounding water. Water quality that is not properly maintained can cause various problems, such as stress, disease, and even fish death. The main problems often faced by cultivators are sudden changes in water quality and a lack of real-time water quality monitoring. Therefore, a monitoring system is needed that can help maintain pool water quality and send information regarding changes in pool water quality. In developing this system, a NodeMCU ESP32 microcontroller, 4502C pH sensor, TDS sensor, and TFT screen were used. The system developed in this research uses a pH sensor and a Total Dissolved Solid (TDS) sensor to read the degree of acidity and total dissolved substances in the water. The data obtained from these sensors is then processed using Fuzzy logic to determine water quality conditions. In addition, this system can send notifications about water quality, so that farmers can receive the latest information regarding water quality conditions and can immediately take the necessary actions. The method used in developing this system is a prototype model. Calibration testing in this study was carried out on both sensors to evaluate the level of accuracy in reading values, with an error rate of 0.16 for the pH sensor and 0.078 for the TDS sensor respectively. The results show that this system can monitor koi pond water quality effectively and provide timely notifications when significant changes occur in water quality parameters. The notifications given to cultivators consist of three categories: 'Normal water quality!', 'Water quality is sufficient, change the filter immediately!', and 'Poor water quality, change the water immediately!'. Thus, it is hoped that this system can help increase the efficiency and success of koi fish cultivation by reducing mortality rates and increasing the growth and vitality of koi fish.

Keywords: *water quality monitoring, koi fish, fuzzy logic, notification, Internet of Things (IoT)*