

ABSTRACT

Water toxicity detection in fish ponds is essential to maintain fish health and support successful aquaculture. Manual water quality measurement is considered less effective due to the time and effort required, as well as its inability to provide real-time information on changing water conditions. This study developed a water toxicity detection system based on the ESP32-S3 microcontroller integrated with three analog sensors: a Temperature sensor (DS18B20), a pH meter, and a Dissolved Oxygen (DO) meter. The system is designed to automatically and continuously monitor temperature, pH, and dissolved oxygen levels, with the measurement results displayed on an LCD screen. Calibration procedures were carried out to ensure the accuracy of each sensor, while system testing was performed by comparing sensor data with reference instruments. The test results show that the system can provide accurate and responsive readings, making it suitable as a tool for detecting potential water toxicity in fish ponds in real-time. Therefore, this system is expected to assist in rapid decision-making to prevent potential water toxicity in aquaculture environments.

Keywords: water toxicity, water quality, ESP32-S3, temperature sensor, pH sensor, dissolved oxygen (DO), aquaculture, Internet of Things (IoT), real-time monitoring.