

ABSTRACT

Fish is one of the sources of animal-based protein to support community nutrition, especially in coastal areas and archipelagic countries. Conventional fish farming systems have several problems such as parameter changes, wasteful water use, and high operational costs. This research focuses on the design and construction of an automated recirculating aquaculture system (RAS) based on the Allen Bradley Micro810 PLC for food fish farming integrated with various sensors such as a water level sensor, a DS18B20 temperature sensor, a TDS sensor, and a YF-S201 water flow sensor for real-time monitoring and control of water quality parameters. The research method includes designing a system design with sensors and actuators, as well as assembling and testing the equipment in a 120×50×40 cm aquarium with two operating modes (automatic and manual) for 24 hours and 7 days. The test results show optimal equipment performance with sensor accuracy of more than 90% and is able to maintain water parameters within the specified limits through automatic draining and filling mechanisms. There are fluctuations due to environmental factors such as an increase in water temperature due to sunlight, an increase in TDS during feeding, and a decrease in incoming water flow due to filter blockage. The overall system has proven effective in monitoring and stabilizing the water parameters of fish farming continuously, with the note that periodic filter maintenance is required to optimize water flow.

Keywords: *fish farming, recirculating aquaculture system, RAS automation, Allen Bradley Micro810 PLC, sensors and actuators, water parameters.*