

ABSTRACT

Home-scale freshwater lobster cultivation faces challenges in real-time monitoring of water quality (pH, temperature, TDS, turbidity), where manual methods are prone to delays in detecting parameter changes that could potentially degrade lobster health. This research develops an IoT-based monitoring system using sensors integrated with ESP32 to address these issues, with data sent to ThingSpeak and displayed via a website. This solution is crucial because existing technology remains expensive and complex for home-scale cultivation, while freshwater lobsters have high economic value. The designed system offers accuracy and ease of use, as well as features real-time monitoring, historical graphs, and PDF export. Test results demonstrate the system's effectiveness, with lobster growth tending to be better in ponds equipped with the monitoring system compared to conventional ponds, indicating that this system is not only technically functional but also impacts the success of cultivation.

Keywords: freshwater lobster, water quality monitoring, IoT, ESP32, sensor, home-based cultivation