Abstract

Water quality is crucial in catfish farming, which often results in suboptimal water quality. This thesis uses a moving bed kaldnes filter to neutralize harmful substances like ammonia and regulate pH levels. Water from catfish farming is often unsuitable for agriculture, particularly for melon plants that require specific water conditions. This study integrates IoT technology using an ESP32, pH sensor, and MQ135 sensor. The pH sensor detects changes in water pH, while the MQ135 sensor measures ammonia concentration to ensure optimal conditions for melon plants. Data from the sensors are sent to a web server and displayed through a web interface despite delays due to using HTTP as the communication protocol. The objective of this study is to implement an IoT-based system for monitoring and controlling water quality from catfish farming to meet the needs of melon plants, which require pH levels between 6.5 and 7.5 and ammonia concentration not exceeding 0.25 ppm. The threshold-based control system adjusts pH and ammonia levels to maintain water quality. Test results 100 times show that the system successfully maintains water quality within the optimal range for melon plants, despite difficulties in reducing ammonia levels to 0.25 ppm. The aerator showed a success rate of 100% with no error margin. The pH Up system showed a success rate of 99% with a 1% error margin, and the pH Down system showed a success rate of 98% with a 2% error margin

Keywords: Internet of Things, pH, Ammonia, Moving Bed Kaldnes