ACCURACY ANALYSIS OF AN AUTOMATIC FISH FEEDER AND POND WATER QUALITY MONITORING SYSTEM

Ahmad Rofi'i, S.Pd., M.Pd. (Supervisor)

Rizaldi Risqi Sucipto

Department of Engineering
Bachelor of Applied Mechatronics Engineering Technology Program

ABSTRACT

Fish farming is one of the fisheries subsectors that plays an important role in supporting productivity and economic growth. In practice, manual feeding processes often create various challenges, including inaccurate feeding schedules, feed wastage, and declining pond water quality due to uncontrolled feed distribution. Therefore, the implementation of technology capable of automating the feeding process while simultaneously monitoring water quality conditions is required to support the success of aquaculture activities.

This study aims to evaluate the accuracy of an automatic fish feeding system and analyze the performance of a pond water quality monitoring system utilizing a DS18B20 *sensor for temperature measurement, a* pH *sensor for determining water acidity levels, and a turbidity sensor for detecting water turbidity. Furthermore, this research seeks to identify the relationship between valve opening duration and the amount of feed dispensed using a linear regression analysis approach.The research employed an experimental method consisting of system calibration, automatic feeding system testing, water quality sensor testing, data collection, and analysis of the obtained results. Data were collected by measuring the weight of feed released at various valve opening durations and comparing sensor readings with actual conditions as reference values. The collected data were then analyzed using simple linear regression and multiple linear regression methods to determine*

the relationships among the observed variables.The results indicate that the automatic fish feeding system operated effectively and consistently, achieving an accuracy level of more than 95%. Regression analysis of the feeding tests revealed a strong positive linear relationship between valve opening duration and the weight of feed dispensed. The regression equations obtained from the three testing sets were $Y = 16.99 + 21.43X$, $Y = -107.01 + 38.89X$, *and* $Y = -256.26 + 46.51X$, *respectively. The high correlation coefficients and coefficients of determination exceeding* 90% *indicate that valve opening duration has a significant effect on the amount of feed released. In addition, the water quality monitoring system successfully measured temperature, turbidity, and* pH *parameters in real time, thereby supporting more effective, efficient, and sustainable aquaculture management.Keywords: Automatic Fish Feeder, Water Quality Monitoring, Aquaculture, Internet of Things (IoT), Linear Regression,* DS18B20 *Sensor,* pH *Sensor, Turbidity Sensor.*