

DATA ANALYSIS OF SHRIMP POND WATER MONITORING

BASED ON IoT (Internet of Things)

Fendik Eko Purnomo, S.Pd., M.T (Supervisor)

Mahisa Nur Albar

Mechatronics Engineering Technology Study Program

Department of Engineering

ABSTRACT

Vannamei shrimp cultivation requires good water quality management to maintain optimal shrimp growth and survival rates. The main parameters that need to be monitored include pH, temperature, and Total Dissolved Solids (TDS). Conventional monitoring has limitations because it takes longer and cannot provide real-time information. This study aims to design and implement an Internet of Things (IoT)-based shrimp pond water quality monitoring system using an ESP32 microcontroller. The system is equipped with a 4502C pH sensor, a TDS sensor, a DS18B20 temperature sensor, a float sensor, a 16x2 LCD, a Blynk IoT application, and two water pumps as automatic actuators. The research method used is Research and Development (R&D). The test results show an average error percentage of the pH sensor of 4.4%, the TDS sensor of 2.79%, and the temperature sensor of 4.79% compared to conventional measuring instruments. The system is capable of sending data to the Blynk IoT application in real time with a 500 ms transmission interval and a delay of approximately 0.5–1 second under stable network conditions. Time efficiency testing showed that the IoT system only required approximately 5 seconds compared to the 2 minutes required by the conventional method, resulting in a time efficiency of 95.8%. Based on these results, the developed system performed well, increased monitoring effectiveness, and supported faster, more accurate, and more efficient water quality management in shrimp ponds.

Keywords: *Internet of Things (IoT), water quality monitoring, shrimp ponds, ESP32, Blynk IoT.*