ABSTRAK

RANCANG BANGUN ALAT MONITORING KUALITAS AIR PADA BUDIDAYA IKAN NILA MENGGUNAKAN SENSOR *DISSOLVED OXYGEN (DO)* DAN SENSOR SUHU DS18B20 DENGAN MIKROKONTROLER ESP32

(Shalsabillah Amalia Febrianty 2025: 34 Halaman)

Budidaya ikan air tawar sangat bergantung pada kualitas air, terutama parameter kadar oksigen terlarut (*Dissolved Oxygen*/DO) dan suhu air. Namun, dalam praktiknya, pembudidaya sering kali mengalami kesulitan dalam melakukan pemantauan secara rutin dan *real-time* terhadap parameter tersebut. Oleh karena itu, penelitian ini bertujuan untuk merancang dan membangun alat monitoring kualitas air berbasis *Internet of Things* (IoT) dengan menggunakan sensor DO dan sensor suhu DS18B20 yang dikendalikan oleh mikrokontroler ESP32. Sistem ini dirancang agar mampu mengukur dan mengirimkan data secara *real-time* melalui aplikasi *Blynk* yang dapat diakses melalui perangkat *mobile*. Dari pengujian dengan 10 sampel berbeda, didapati hasil pengujian yang menunjukkan bahwa alat mampu bekerja dengan baik dalam mengukur kadar DO dan suhu air secara dinamis, serta dapat mengirimkan data secara stabil melalui jaringan internet. Pengujian dilakukan pada air sungai dengan rata-rata kadar DO sebesar 3,43 mg/L dan suhu berkisar antara 25,81°C hingga 28,87°C. Dengan kemampuan monitoring secara *real-time* dan jarak jauh, alat ini diharapkan dapat menjadi alat bantu bagi pembudidaya ikan air tawar.

Kata kunci: *Dissolved Oxygen,* DS18B20, IoT, ESP32, *Blynk,* monitoring kualitas air, budidaya ikan nila.

ABSTRACT

DESIGN AND DEVELOPMENT OF A WATER QUALITY MONITORING SYSTEM FOR NILE TILAPIA AQUACULTURE USING DISSOLVED OXYGEN (DO) SENSOR AND DS18B20 TEMPERATURE SENSOR WITH ESP32 MICROCONTROLLER

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Freshwater fish farming heavily depends on water quality, particularly on parameters such as Dissolved oxygen (DO) levels and water temperature. However, in practice, farmers often encounter difficulties in conducting routine and real-time monitoring of these parameters. Therefore, this research aims to design and develop a water quality monitoring device based on Internet of Things (IoT) technology using a DO sensor and a DS18B20 temperature sensor controlled by an ESP32 microcontroller. The system is designed to measure and transmit data in real time via the Blynk application, which can be accessed through mobile devices. Based on testing with 10 different samples, the results show that the device performs well in dynamically measuring DO levels and water temperature, and is capable of transmitting data reliably over the internet. The testing was conducted using river water, with an average DO level of 3.43 mg/L and temperature ranging from 25.81°C to 28.87°C. With its real-time and remote monitoring capabilities, this device is expected to serve as a useful tool for freshwater fish farmers.

Keywords: *Dissolved Oxygen, DS18B20, IoT, ESP32, Blynk, water quality monitoring, freshwater aquaculture.*