

ABSTRAK

DESAIN SISTEM PEMANTAUAN *REAL-TIME* UNTUK PERTUMBUHAN IKAN DAN KUALITAS AIR DALAM SISTEM AQUAPONIK

(2025: 71 Halaman + 24 Gambar + 4 Tabel + Daftar Pustaka + Lampiran)

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Penelitian ini bertujuan untuk merancang dan mengimplementasikan sistem pemantauan real-time guna mengawasi parameter kualitas air, khususnya kadar oksigen terlarut (Dissolved Oxygen/DO), serta memantau pertumbuhan ikan dalam sistem akuaponik. Sistem ini terdiri atas sensor DO, unit aerasi (aerator), dan kamera pengawas 360° yang terhubung dengan aplikasi V360 sebagai antarmuka visual. Uji coba dilakukan selama tiga minggu di lokasi sistem akuaponik Kecamatan Gandus, Palembang, dengan objek budidaya ikan nila merah (*Oreochromis niloticus*) dan gurame kuning (*Osphronemus goramy*). Hasil pengamatan menunjukkan bahwa kadar DO berkisar antara 6,1 hingga 6,8 mg/L saat aerator beroperasi, dengan peningkatan massa ikan rata-rata dari 46 gram menjadi 60 gram. Sebaliknya, ketika aerator dinonaktifkan selama satu hari, kadar DO menurun drastis menjadi 1,5 mg/L dan menyebabkan mortalitas pada ikan. Integrasi kamera CCTV memungkinkan deteksi visual terhadap perubahan perilaku ikan,. Temuan ini menunjukkan bahwa sistem yang dirancang mampu menyediakan data real-time yang valid dan dapat dijadikan dasar pengambilan keputusan preventif dalam pengelolaan sistem akuaponik berbasis teknologi.

Kata Kunci: Sistem Pemantauan Real-Time, Sensor DO, Kamera CCTV.

ABSTRAC

DESIGN OF A REAL-TIME MONITORING SYSTEM FOR FISH GROWTH AND WATER QUALITY IN AN AQUAPONIC SYSTEM

(2025: 71 Pages + 24 Figures + 4 Tables + References + Appendices)

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*This study aims to design and implement a real-time monitoring system to observe water quality parameters, particularly dissolved oxygen (DO) levels, and monitor fish growth in an aquaponic system. The system comprises a DO sensor, an aeration unit (aerator), and a 360° surveillance camera integrated with the V360 application as a visual interface. The trial was conducted over three weeks at an aquaponic system site in Gandus District, Palembang, with red tilapia (*Oreochromis niloticus*) and yellow gourami (*Osphronemus goramy*) as the cultured species. Observations indicated that DO levels ranged between 6.1 and 6.8 mg/L when the aerator was active, with an average fish weight increase from 46 grams to 60 grams. Conversely, when the aerator was turned off for one day, DO levels dropped drastically to 1.5 mg/L, resulting in fish mortality. The integration of the CCTV camera enabled visual detection of behavioral changes in the fish, such as increased surfacing frequency due to hypoxia. These findings demonstrate that the designed system is capable of providing valid real-time data, which can serve as a basis for preventive decision-making in technology-based aquaponic management.*

Keywords: Real-Time Monitoring System, DO Sensor, CCTV Camera.