

ABSTRAK

Rancang bangun alat pengukur *PH*, *TDS*, dan suhu air pada kolam ikan serta monitoring berbasis *internet of things (IOT)*

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Dalam budidaya ikan, kualitas air merupakan elemen krusial yang sangat menentukan keberhasilan proses pemeliharaan. Parameter penting seperti pH, Total Dissolved Solids (TDS), dan suhu air harus dijaga dalam kondisi ideal untuk mendukung kesehatan dan pertumbuhan ikan secara optimal. Namun, metode pemantauan konvensional yang dilakukan secara manual dinilai kurang efisien karena membutuhkan waktu, tenaga, dan berisiko mengalami kesalahan pencatatan data. Untuk menjawab tantangan tersebut, penelitian ini merancang dan membangun sebuah alat pengukur kualitas air yang mampu memantau pH, TDS, dan suhu secara otomatis serta real-time berbasis teknologi Internet of Things (IoT). Sistem ini mengintegrasikan mikrokontroler ESP32 dengan sensor pH, sensor TDS, dan sensor suhu DS18B20. Data hasil pengukuran ditampilkan melalui layar LCD dan dikirimkan secara langsung ke aplikasi Blynk melalui koneksi Wi-Fi, sehingga pengguna dapat memantau kondisi air dari jarak jauh menggunakan perangkat Android. Alat ini juga dilengkapi dengan fitur notifikasi berupa buzzer dan lampu indikator sebagai peringatan ketika parameter air melebihi ambang batas yang telah ditentukan.

Kata Kunci: pH, TDS, Suhu Air, Kolam Ikan, Monitoring, Internet of Things (IoT), ESP32, Blynk.

ABSTRACT

Design and build a device for measuring pH, TDS, and water temperature in fish ponds and monitoring based on the internet of things (IOT)

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Water quality is a crucial factor in the success of fish farming, as it directly influences fish health, growth, and productivity. Key parameters such as pH, Total Dissolved Solids (TDS), and water temperature must be maintained at optimal levels. Traditional monitoring methods that rely on manual measurement are often inefficient, time-consuming, and prone to human error. To address this issue, this study presents the design and development of a water quality monitoring device that measures pH, TDS, and temperature automatically and in real-time using Internet of Things (IoT) technology. The system integrates an ESP32 microcontroller with pH sensors, TDS sensors, and DS18B20 temperature sensors. The collected data is displayed on an LCD screen and transmitted via Wi-Fi to the Blynk application, allowing users to monitor water conditions remotely through Android devices. Additionally, the device includes a notification system using a buzzer and indicator lights to alert users when water parameters exceed predefined thresholds. The device was tested in various fish ponds with different conditions to evaluate its accuracy and reliability. Results show that the device operates effectively, providing accurate, consistent, and real-time data that is easily accessible. This tool is highly applicable for small to medium-scale aquaculture operations and holds potential for further development by integrating automated control features and additional sensors to enhance system functionality and water management efficiency.

Keywords

pH, TDS, Water Temperature, Fish Pond, Monitoring, Internet of Things (IoT), ESP32, Blynk.