

**SISTEM OTOMATISASI SUHU DAN PH AIR PADA TANAMAN
AQUASCAPE MENGGUNAKAN METODE
FUZZY INFERENCE SYSTEM**

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ABSTRACT

This study discusses the design and implementation of an automated temperature and pH control system for aquascape plants using the Fuzzy Mamdani Inference System, accessible via a website. The system employs the DS18B20 temperature sensor and the 4502C pH sensor connected to an ESP32 microcontroller. The data obtained from the sensors is processed using Mamdani fuzzy logic to provide real-time information and automatically control the fan and water pump. The system activates the fan when the water temperature exceeds 28°C and the pump when the pH falls outside the ideal range ($pH < 5.8$ or $pH > 7.5$). All data and system controls can be monitored through a web-based dashboard. Testing of the system shows an overall accuracy of 99.8%, with an accuracy of 98.64% for temperature and 98.72% for pH. These results demonstrate the effectiveness of the fuzzy logic-based system in maintaining optimal water quality to support the growth of aquascape plants.

Keyword:

Automated System, Temperature Control, pH Control, Fuzzy Mamdani, Aquascape,