

## ABSTRAK

Budidaya tanaman *microgreen* menjadi salah satu pilihan untuk mengembangkan pertanian di perkotaan. Dengan menanam *microgreen* untuk kebutuhan sendiri juga kita mendapatkan nilai lebih tinggi daripada membeli di pasar swalayan. Namun banyak yang menganggap merepotkan karena harus menyiram tanaman minimal dua kali sehari, dengan adanya sistem pemantauan dan penyiraman otomatis berbasis *Internet of Things* (IoT) dapat mempermudah kegiatan pertanian *microgreen* di perkotaan.

Pada penelitian ini dilakukan menggunakan mikrokontroler NodeMCU, sensor suhu DHT-22, sensor kelembaban tanah YL-69, dengan metode *fuzzy logic control* mamdani. Pada perhitungan metode fuzzy menggunakan dua parameter *input* yaitu suhu dan kelembaban tanah dengan *output* berupa lama waktu pendinginan (kipas angin) dan penyiraman (pompa) pada tanaman *microgreen*.

Berdasarkan hasil pengujian alat yang telah dilakukan, sistem pemantauan suhu dan kelembaban tanah berhasil diakses melalui aplikasi Telegram dengan *delay* komunikasi rata-rata 12 detik. Pengujian sensor suhu DHT-22 memiliki nilai rata-rata *error* sebesar 4.389%, pengujian sensor kelembaban tanah YL-69 memiliki nilai rata-rata *error* sebesar 10.869%, dan pengujian sensor ultrasonik HC-SR04 memiliki nilai rata-rata *error* sebesar 8.26%. Pengujian perhitungan *fuzzy logic control* membandingkan hasil perhitungan mikrokontroler dengan Matlab. Dengan hasil perbandingan didapatkan rata-rata *error* sebesar 2.206% untuk kipas dan 27.057% untuk pompa.

*Kata kunci : Fuzzy Logic Control, Internet of Things, Mamdani, Microgreen, NodeMCU, Telegram.*

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## ABSTRACT

Microgreen plants cultivation is one of the choices to develop agriculture in urban areas. By planting microgreen for our own needs as well as earning a higher score than buying at a supermarket. But many feel it is inconvenient to have to water plants at least twice a day, with the Internet of Things (IoT) - based monitoring and sprinkling system of things making things easier on microgreen farms activities in cities.

In the study was conducted with using a microcontroller NodeMCU, DHT-22 temperature sensor, YL-69 soil humidity sensor, with the fuzzy logic control method. In calculating fuzzy methods, using two input parameters, namely, the temperature and humidity of the soil and the output of long cooling time (fans) and the pumping of microgreen plants.

Based on the results of the test the tools already done, the system for monitoring the temperature and moisture of the soil was accessed via the Telegram application with an average of 12 seconds of data transfer. The DHT-22 temperature sensor testing to an average error of 4,389%, the YL-69 soil humidity sensor testing to an average an error of 10,869%, and testing for HC-SR04 ultrasonic sensors an average error of 8,26%. Testing fuzzy logic control compared microcontroller's calculations to Matlab. With results the ratio was obtained an average of 2.206% for fan and 27,057% for the pump.

*Keywords : Fuzzy Logic Control, Internet of Things, Microgreen, NodeMCU, Telegram.*



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