

ABSTRACT

The environmental temperature, ammonia, and water pH monitoring system in aquaponics has been successfully developed by utilizing Internet of Things technology. This system employs the ESP32 microcontroller as the main controller, integrated with several sensors, including the MQ-135 sensor for detecting air quality, the DFRobot Analog pH sensor for measuring water acidity levels, and the DHT22 sensor for monitoring temperature and humidity. The test results show that the system exhibits good accuracy, with the error rate of each sensor as follows: the MQ-135 sensor at 1.36%, the DFRobot Analog pH sensor at 1.91%, and the DHT22 sensor at 0.53%. The data obtained from the sensors is transmitted in real-time to the Blynk platform, which not only displays monitoring information but also provides notifications when any parameter exceeds the predefined set point limits. With this system, the monitoring of environmental conditions and water quality in aquaponic systems can be carried out efficiently and accurately, thus enhancing the effectiveness of sustainable aquaponic management.

Keywords: *Aquaponics, Blynk, DHT22 sensor, pH Analog DFRobot sensor, MQ-135 sensor.*