MONITORING AND CONTROLLING SYSTEM OF WATER QUALITY IN GUPPY FISH USING SUGENO FUZZY LOGIC METHOD

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ABSTRACT

Quality water is crucial for the health and development of guppy fish. The manual water quality monitoring process is considered inefficient and unable to provide a quick response to changes in water conditions. This study aims to design and implement a water quality monitoring and control system based on the Internet of Things (IoT) using the Fuzzy Logic Sugeno method. This device utilizes an ESP32 microcontroller along with several sensors to measure temperature, pH, Total Dissolved Solids (TDS), and Dissolved Oxygen (DO) parameters, which are then analyzed using the fuzzy method to assess water quality. The analysis results are presented through a web interface and connected to actuators such as heaters, DC fans, and solenoid valves to carry out automatic actions according to water conditions. The test results show that the system can detect changes in water parameters directly with high accuracy, and also shows consistent performance in controlling hardware automatically. Therefore, this system can be an effective answer to improve efficiency in monitoring and controlling water quality in guppy fish ponds.

Keywords: Fuzzy Sugeno, guppy, water quality monitoring