

# **Aquascape Health Monitoring With IoT Based Automation System And Fuzzy Logic Mamdani**

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## **ABSTRACT**

*Aquascaping is the art of arranging aquatic ecosystems in an aquarium that relies on balanced water parameters such as pH, and turbidity. Imbalance in these parameters can harm photosynthesis processes and the health of fish and plants. Manual monitoring is often ineffective and prone to error. This study developed an automatic aquascape health monitoring system based on the Internet of Things (IoT) integrated with Fuzzy Mamdani logic. The system uses an ESP32 microcontroller, pH sensor, and turbidity sensor. Data is transmitted in real-time to a web dashboard and analyzed using fuzzy logic to decide on actions such as activating a pump. Testing shows that the system maintains environmental parameters within optimal ranges and makes adaptive decisions. The system proves effective in replacing manual monitoring and enhances the efficiency and accuracy of aquascape maintenance.*

**Keywords:** *Aquascape, IoT, ESP32, Sensors, Fuzzy Mamdani*