

ABSTRACT

LIVE MONITORING OF FISH PONDS BASED ON ANDROID WITH MACHINE LEARNING TECHNOLOGY FOR WATER QUALITY CLASSIFICATION

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*The aquaculture industry, including catfish (*Clarias sp*) farming, is a vital sector in meeting the demand for animal protein in many countries, including Indonesia. However, catfish farming faces significant challenges, particularly changes in critical parameters such as ammonia levels, which are toxic. High ammonia levels can cause stress in fish, weaken their immunity, and even lead to mass mortality. This study aims to develop an innovative system in the form of an Android-based water quality monitoring application utilizing Internet of Things (IoT) technology and the K-Modes algorithm in machine learning for water quality classification. By employing the K-Modes algorithm, the system can cluster water parameters (temperature, pH, and ammonia) into relevant water quality categories, such as "safe" or "unsafe." Real-time notifications are sent to fish farmers when water parameters approach or exceed hazardous thresholds, enabling rapid action to maintain optimal pond conditions. The system was tested using real data collected from catfish farming ponds through interviews with aquaculture practitioners. Evaluation results showed a silhouette score of 0.82, indicating good clustering performance. Furthermore, black-box testing of the application demonstrated satisfactory results, with all features functioning as expected. This system has proven effective in accurately monitoring water quality, providing early warnings, and minimizing the risk of fish mortality. The application also reduces human error in the monitoring process, improves operational efficiency, and paves the way for broader implementation of IoT and machine learning technologies in aquaculture innovations.*

Keywords: Live monitoring, Android, machine learning, IoT, K-Modes.