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*by* Erna Yuliwati Dkk

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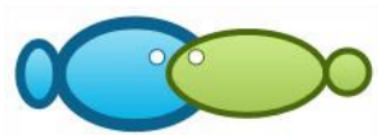
**Submission date:** 14-Jun-2023 03:06PM (UTC+0700)

**Submission ID:** 2115818338

**File name:** 33\_Proquest\_article\_Tiara\_Erna\_Amin\_Unsri.pdf (354.39K)

**Word count:** 546

**Character count:** 3065



# **1** Investigation of water quality in a tilapia (*Oreochromis niloticus*) culture area with embedded net cages in Warkuk Ranau Selatan District, Indonesia

<sup>1</sup>Tiara Santeri, <sup>2</sup>Mohamad Amin, <sup>3</sup>Erna Yuliwati

<sup>1</sup> Environmental Management, Sriwijaya University, Palembang, Indonesia; <sup>2</sup> Faculty of Agriculture, Sriwijaya University, Inderalaya, Indonesia; <sup>3</sup> Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia. Corresponding author: M. Amin, mohamadamin@fp.unsri.ac.id

**Abstract.** The waters of Lake Ranau, Warkuk Ranau Selatan District, Indonesia, are an area suitable for the development of tilapia aquaculture using embedded net cages. Organic waste generated from aquaculture activities can decrease the quality of lake waters. The purpose of this study was to analyze the quality of the waters of Lake Ranau in Warkuk Ranau Selatan District. This research was conducted in January 2020. Analysis of water quality data used the Pollution Index method. The results showed that water quality parameters could be included in the good category, except for ammonia concentration at several stations, where values exceeded the quality standard. This is likely to occur because of excessive fish farming and settlement activities around the waters. Overall, the waters of Lake Ranau in the Warkuk Ranau Selatan District are still viable for tilapia aquaculture activities using embedded net cages. **Key Words:** aquaculture, Lake Ranau, organic, viable parameters.

**Introduction.** Lake Ranau is one of the natural resources used in fish farming. It has long been used by local fishing communities in making a living (Makmur et al 2017). Lake Ranau is a place for Nile tilapia (*Oreochromis niloticus*) aquaculture using embedded net cages (KJT) by the communities near the lake. Communities in the region use KJT aquaculture activities as permanent or side livelihoods.

Based on the 2016 Data of Fishery Production in Warkuk Ranau Selatan District, 322 units of KJT produced 716 tons of tilapia. Fish farming with the KJT system greatly helps the economy and the welfare of the community. However, aquaculture production activities must still pay attention to the preservation of resources and the environment to create a sustainable cultivation area.

Organic waste generated from fish farming activities can decrease the quality of lake waters. The farming waste disperses into the waters, increasing nutrient levels and polluting the environment (Erlania 2010; Urbasa et al 2015; Tokah et al 2017). This is in accordance with Hidayah et al (2014), Muhaemi et al (2015), and Syawal et al (2016), that the water quality derivation is caused by various activities of the lakeshore communities and entrepreneurs.

The research results of Saputra et al (2017) also show the high values of ammonia, nitrate, and sulfide caused by the accumulation of several pollutant wastes from floating net cages (KJA) feed residue, local community waste, and agricultural activities around Lake Buyan. Good water quality will have a positive impact on the fish, ensuring the continuity of tilapia production supply in the desired amount, while poor water quality can cause fish growth and welfare to suffer.

Cultivation locations are a determinant component for successful tilapia farming at Warkuk Ranau Selatan District. It affects the sustainability of aquaculture activities and ecosystems in its area. The location of the cultivation is closely related to the water quality parameters supporting the cultivation process (Muhaemi et al 2015). The waste

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