

TURBIDITY AND TROPHIC STATE DYNAMICS IN MADURUOYA RESERVOIR AND SENANAYAKE SAMUDRAYA, SRI LANKA

K.G.S. Chathurangani^{1#}, R.H.G.R. Wathsala¹, M.A.P.P. Kumari¹, and S.S. Gunasekara^{2*}

¹*Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka*

²*National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka*

*Correspondence E-mail: s22gtech@gmail.com, Phone: +94 712273646

#Presenting Author

Abstract: Inland fisheries in Sri Lanka, primarily within reservoirs and tank cascade systems, hold significant potential for sustainable fish farming and livelihood of people. This study employed images of the Lake Water Quality 300 m version 1 (Near-Real-Time) products of the Sentinel-3 OLCI (Ocean and Land Colour Instrument) sensor obtained from the Copernicus Global Land Service for every 10 days during May 2016 to December 2019 to evaluate the overall conditions and mean monthly and annual variations and relationship of Lake Turbidity and Trophic State Index (TSI) in Maduruoya reservoir (MO) and Senanayake Samudraya (SS). According to the Carlson's Trophic State Index, MO exhibited an upper mesotrophic status (TSI 52 ± 0.54), while SS displayed a lower mesotrophic status (TSI 44.34 ± 0.76). The SS had a greater turbidity level (20.23 ± 1.43 NTU) than MO (9.31 ± 0.77 NTU). Higher TSI levels were found in deeper areas and near the reservoir dam, while in contrast, increased turbidity was observed in littoral zone compared to the dam area and middle of the reservoirs. The TSI has reduced (34-46 NTU) with the onset of rains in the second inter-monsoon and the North-East monsoon. TSI was increased in post rainy seasons and with the beginning of the distinct dry period in the dry zone reservoirs have experienced higher TSI levels (48.2-55.8 NTU). This verified the temporal variation in the trophic status of reservoirs consist of lower values in the rainy season and gradually increased over the dry period and vice versa. After the rainy season and second inter-monsoon, higher turbidity (20.2-42.3 NTU) values were observed. The turbidity was gradually reduced in the dry season (5.8-10.9 NTU). The regression model between TSI and turbidity for SS ($R^2=0.86$) had a stronger fit compared to the model for MO ($R^2=0.51$). It can be concluded that there are clear seasonal trends in TSI and turbidity associated with the rainy season in MO and SS

Keywords: Inland fisheries; Fish production; Mesotrophic status; Season