Physical and Microbiological Parameters Quality Monitoring of Unhas Lake Water

Rita Tahir Lopa*, Mary Selintung**, Marthen P. Lakatua***, Muhammad Chaerul***, Tutut Hardiyanti****, Feby Afida***

*Associate Professor of River Engineering Laboratory, Hasanuddin University, Perintis Kemerdekaan km.10, Makassar 90245, Indonesia
**Professor of Environmental Laboratory, Hasanuddin University, Perintis Kemerdekaan km.10, Makassar 90245, Indonesia
***Graduate Student of Civil Engineering Department, Hasanuddin University, Perintis Kemerdekaan km.10, Makassar 90245, Indonesia
****Student of Environmental Engineering, Hasanuddin University, Perintis Kemerdekaan km.10, Makassar 90245, Indonesia

Abstract

The Hasanuddin University has two lakes / site that form a reservoir ecosystem network of water potential as a buffer zone soil water conservation both inside the campus and the region around the Unhas campus. The water quality of ground water supply, the water has been influenced by the quality of surface water as its source. Nevertheless, seeming at the current condition, the growth of water hyacinth uncontrollably occurs in the Unhas Lake Water that potential environmental problem that demands attention from several parties. The increasing growth of water hyacinth on Unhas Lake is caused by various sources of pollutants that enter and accumulate in the Unhas Lake, among other nutrient build up that may cause eutrophication in the water which resulted in the death of a variety of aquatic biota, including fish. Increased turbidity and color are caused by eutrophication events are managed hardly as drinking water. Therefore, Unhas Lake Water resources must be protected in order to put good use by humans and other living things through the monitoring of Lake Unhas water quality regularly and continuously.

The research method is an observational method with a descriptive study design. The water samples were taken from Unhas Lake which is divided into five sampling points determined by purposive sampling method. This research has been conducted in dry season and rainy season.

Based on physical parameters test results of five sampling points obtained, Unhas Lake Water temperatures were quite stable, ranged between 27.2°C-28.2°C in dry season and 27°C-28°C in rainy season. TDS test results obtained that TDS levels of Unhas Lake Water ranged from 129 mg/l-140 mg/l in dry season and 790 mg/l-824 mg/l in rainy season were under water quality standard for Class I that requires TDS level maximum 1000 mg/l. Meanwhile, TSS test results that meet class I quality standard was station 2, 3, 4, ranged between 10 mg/l-26 mg/l in dry season and while stations (points) that did not meet the quality standard for Class I were station 1 and 5 i.e. 60 mg/l and 90 mg/l while the maximum permissible level was 50 mg/l. In rainy season, TSS test results that meet class I quality standard was station 1, 2, 3, 4, and 5 ranged between 3 mg/l-7 mg/l.

Based on microbiological parameters test results of five sampling points showed that Fecal coliform bacteria level at stations (points) 1, 2, 3, 4, and 5 were 295 MPN/100 ml, 4352 MPN/100 ml, 17329 MPN/100 ml, 142 MPN/100 ml, and 30 MPN/100 ml respectively in dry season and 7 MPN/100 ml, 0 MPN/100 ml, 3 MPN/100 ml, 11 MPN/100 ml, and 7 MPN/100 ml, respectively in rainy season. Fecal coliform bacteria with the highest number was at the station (point) 3 and the lowest was at the station (point) 5. The number of total coliform bacteria at stations 1, 2, 3, 4, and 5 were 24196 MPN/100 ml, > 24196 MPN/100 ml, > 24196 MPN/100 ml, 10462 MPN/100 ml, and 10462 MPN/100 ml, total coliform bacteria with the highest number were at the station (point) 2 and 3 and the lowest were at the station (point) 4 and 5 in dry season. In rainy season, the number of total coliform bacteria at stations 1, 2, 3, 4, and 5 were 72400 MPN/100 ml, > 75 MPN/100 ml, > 20 MPN/100 ml, 1100 MPN/100 ml, and 400 MPN/100 ml. The water quality status of Unhas Lake is not suitable for water quality standard designation of class I and class II listed in Government Regulation Number 82 Year 2001, but still good enough for the allotment of class III and class IV or contaminated medium.

Keywords
Unhas Lake; water quality; physical and microbiological parameters.