

Pollution Assessment of the Physico-Chemical Properties of the Lagos Lagoon

Loto O. O.* and A. O. Ajibare

Department of Fisheries and Aquaculture Technology, Olusegun Agagu University
of Science and Technology Okitipupa, Nigeria

Abstract

Lagos lagoon has received wastewater discharged from different anthropogenic sources. Therefore, this study determined the water quality and identified its pollution status. Water quality index (WQI), several heavy metal pollution indices as well as single factor and comprehensive pollution indices were applied. The obtained data revealed that physicochemical parameter varied between 24.00 ± 1.41 and $27.00\pm 0.71^{\circ}\text{C}$ for temperature; 2.50 ± 2.83 and $10.50\pm 0.71\%$ for salinity; 3.90 ± 0.99 and 4.60 ± 0.85 mg/l for dissolved oxygen; 7.26 ± 0.25 and 8.38 ± 0.66 for pH; 3.50 ± 0.71 and 10.00 ± 7.07 mg/l for BOD. The results also revealed that sulphate, phosphate and nitrate had means of 10.00 ± 10.45 mg/l, 0.85 ± 1.04 mg/l and 11.11 ± 17.88 mg/l respectively while Pb, Zn, Cu and Hg had means of 0.25 ± 0.49 mg/l, 25.49 ± 44.27 mg/l, 1.88 ± 2.94 mg/l and 0.00 ± 0.00 mg/l respectively. SPI classified pH, BOD, Cu and Zn within the 'medium pollution' category while nitrate and phosphate indicated heavy pollution of the lagoon. The PI revealed that Cu and Zn had moderate and slight effect on the aquatic environment respectively while Pb and Hg had no effect on the ecosystem. The mean WQI revealed that the lagoon was classified to be good for aquatic biota despite that HEI and Cd revealed that there was high pollution of heavy metals in the lagoon. The CPI described the lagoon as slightly polluted.

Keywords: Pollution Index (Pi); Contamination Index (Cd); Water Quality Index (WQI); Heavy Metal Evaluation Index (HEI).

Email: jide.loto@gmail.com

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