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Assessment of human impact on water quality along Manyame River

Tirivashe P. Masere *, Adelaide Munodawafa, Tavengwa Chitata

Midlands State University, P. Bag 9055, Gweru, Zimbabwe

Abstract

Human activities such as urbanization, agriculture, sewage treatment and industrialization are affecting water resources both quantitatively and qualitatively. The impact of these activities were studied by measuring and determining the concentration and values of eight selected water quality parameters namely nitrates, phosphates, copper, iron, biochemical oxygen demand (BOD), dissolved oxygen (DO), pH and turbidity along Manyame River, in the Manyame Catchment. Thirty five sites were sampled from the source of the river which is at Seke Dam, along Manyame River and on the tributaries (Ruwa, Nyatsime, Mukuvisi and Marimba) just before they join the river. The 35 sites were categorized into 5 groups (A, B, C, D and E) with group A and E being the upstream and downstream of Manyame. The analysis of results was undertaken using a simple one-way ANOVA with group as the only source of variation. Turbidity values, nitrate and phosphate concentrations were found to be higher than the Zimbabwe National Water Authority (ZINWA) maximum permissible standards for surface waters. DO saturation in the downstream groups was less than 75% (ZINWA standard). Agricultural and urban runoff and sewage effluent were responsible of the high nutrient levels and turbidity, which in turn, reduced the dissolved oxygen (DO).

Keywords: Agriculture, Pollution, Sewage, Urbanization, Water quality

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* Corresponding author. E-mail address: Email: tpmasere@yahoo.com, maseret@msu.ac.zw