ABSTRACT

Water pollution is the change in physico-chemical and biological properties of water quality that is harmful to living things. It is caused by pollutants drawn from point and non-point sources of pollution including industrial and agricultural effluents. It can also be attributed to inappropriate use of chemicals and haphazard disposal of waste. It has become a global concern due to the lethal and sublethal effects on fauna and flora. Sosiani River traverses Eldoret town, draining effluent openly discharged. This river is an important source of industrial and domestic water for residents living in Eldoret, Turbo and along the riparian. This study assessed longitudinal and seasonal variations in physicochemical and microbiological water quality. Composite water samples were collected from 13 effluent discharge points along Sosiani River for one year and analyzed using American Public Health Association water sampling and processing procedures. Medical data was collected from health facilities in Eldoret Township. Data was managed using Statistical Packages for Social Sciences version 20. Both descriptive and inferential statistics like analysis of variance, correlation and regression analysis were used in analysing the resultant data. Sosiani River exhibited high mean levels of turbidity at 64 ± 53.4 Nephelometric Turbidity Units, high biological oxygen demand at 122.8 ± 123.8mg/L, high chemical oxygen demand at 205.0 ± 190.2 mg/L, high total suspended solids at 173 ± 34.14 mg/L, high total dissolved solids at 171.3 ± 11.66mg/L, Escherichia coli at 57.0 ± 54.3mg/L Colony Forming Units /100ml, total coliforms at 135.1 ± 119.6CFU/100ml and cadmium at 0.048 ± 0.07mg/L above National Environment Management Authority (NEMA) guidelines. Sosiani River exhibited significant differences in seasonal and longitudinal variations in physico-chemical and microbiological properties of water quality at $P<0.005$. The river exhibited significant seasonal and longitudinal variation in levels of Escherichia coli at $F = 5.10$ and $P < 0.001$. However, prevalent water borne diseases in the study area; diarrhea at $t = 0.6387$, $P < 0.5374$; dysentery at $t = 1.2839$ $P < 0.2281$ and typhoid at $t = 0.3588$, $P < 0.7272$ did not vary significantly during the dry and wet season. Water Resource Authority and NEMA should ensure all industries and hotels use constructed wetlands or are connected to the centralised sewerage system. The County Government should relocate Huruma dumpsite from the banks of the river and plant trees and grass along the river. Residents should treat drinking water sourced from Sosiani River at household level. Finally access to adequate sanitation should be increased to curb haphazard disposal of solid and liquid waste.