The Impact of Nitrogenous and Phosphorous Nutrients from Selected Point Sources in Kisumu City on River Kisat and Nyalenda Wigwa Stream before Their Discharge into Winam Gulf, Lake Victoria.

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Abstract

Various industrial facilities including a fish-processing factory, a matchbox factory, a flour mill and a landfill, all in Kisumu City in Kenya, were studied and found to discharge significant amounts of NO_2^-–N, NO_3^-–N, org N, total N and total P into River Kisat and Winam Gulf of Lake Victoria, with % increases in the mean levels at the outlets of these facilities ranging from 9.6 to 200, 5.9 to 43.5, 9.3 to 96.1, 8.1 to 35.5 and 9.7 to 50.5 %, respectively. The concentrations of NO_2^-–N, NO_3^-–N, NH_3–N, org N and total N attributable to these facilities increased by 1,509, 51.1, 112.6, 97.5 and 90.6 %, respectively, at the point of entry into Rive Kisat. The Nyalenda Wastewater Stabilization Ponds reduced the mean levels of NO_2^-–N, NO_3^-–N, org N, total N and T-P by 50, 10.4, 16.6, 7.8 and 30.8 %, respectively, indicating low efficacy of their removal and potential impact on water quality in Lake Victoria. The efficacy of the Kisat wastewater treatment plant was also found to be very low with % reductions of the analysed nutrients ranging from 2.82 to 41.30 %.

Keywords: Environmental assessment N, P nutrients Kisumu City Lake Victoria.

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