

Assessment of water quality and identification of pollution status of Negombo estuary in Sri Lanka

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Industrial pollution and domestic solid waste dumping are considered as the major pollution sources of the Negombo estuary. Based on the pollution inputs into the estuary, it is considered that different localities within the estuary are polluted at different rates. A study was done with the objectives to determine the levels of physico-chemical parameters of water quality with special reference to identified pollution sources. For this study, water samples were collected from fourteen sampling locations during one year study period from January to December 2014 and important physico-chemical parameters such as conductivity, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), phosphate-P, Nitrate-N, Ammoniacal-N and heavy metal (Pb, Cd and Hg) levels were analyzed employing standard methods. The results revealed that the average conductivity of 24.8 ± 13.6 ms/cm, concentrations of nitrate 0.81 ± 0.87 mg/L, phosphate 0.27 ± 0.31 mg/L and ammonia 0.15 ± 0.27 mg/L levels were below the maximum permissible limits of the proposed tolerance limits for the discharge of industrial wastewater quality standards for Central Environmental Authority, 2001 in Sri Lanka. The values obtained on BOD 23.6 ± 7.1 mg/L and COD 469.0 ± 36.5 mg/L levels were much higher than the permissible threshold limits. Results indicated that the concentrations of heavy metals Pb, Cd and Hg in water were 0.01 to 0.005 ppm, 0.0 to 0.01 ppm and 0 to 0.013 ppm, respectively. The detected average concentration of mercury in water was above the standard limits. The results obtained for levels of BOD, COD and heavy metals revealed that high pollution takes place in industrial and domestic sewage sampling sites. The South region receives water mainly from Dandugam Oya which carries various effluents from Ekala industrial zone. East region receives discharge of effluents from mainly Katunayake industrial processing zone. North region of the estuary, the levels of BOD, COD and heavy metals in water were higher due to the discharge of industrial effluents and domestic solid waste into the estuary. The highest concentrations of BOD, COD and heavy metals were recorded in the Northern area followed by Southern, Eastern and Western regions indicating the pollution status of the estuarine water.

Keywords: Negombo estuary, water quality, permissible limit, pollution status.