

Sediment quality in Hambantota Harbour basin: a baseline assessment

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Water column processes are recorded in sediments. Accumulated allochthonous and autochthonous organic matter finally store in sediments. The concentration of this sedimentary organic matter can be used as an indicator for the trophic state. Metal molecules may act as a record of the input of contaminants. The aim of the study was to investigate the sediment quality of Hambantota harbour with reference to selected metals and organic matter. Triplicate sediment samples were collected from 13 sampling sites each covering inner and outer harbour areas of the Hambantota harbour. Samples were digested in Kjeldhal digestion system and analyzed using Atomic Absorption Spectrometer to determine the Pb, Ni, Cu and Zn concentrations. The concentration of metals was assessed against the Background Assessment Concentrations (BACs) and Effects Range Low/Effects Range Median (ERL and ERM) concentrations. Organic matter content was determined by using loss on ignition (LOI) method according to the CRIMP protocol. According to the results, Zn is the most prominent metal in all stations and ranged between 13.57 ± 4.8 and $239.2 \pm 9.3 \mu\text{g g}^{-1}$ (dry weight) followed by Cu (39.1 ± 9.0 and 97.1 ± 12.7), Ni ($0.5 \pm 0.2 - 113.9 \pm 8.6$) and Pb ($9.9 \pm 3 - 44.4 \pm 6.4$). Although Ni concentration in all stations showed above ERM concentration, none of the other metals did not exceed the ERM concentration. The organic matter percentage did not vary significantly ($p > 0.05$) between inner harbour and outer harbour sites although its range was between $0.38 \pm 0.04\%$ and $12.42 \pm 0.05\%$. Overall results highlighted that the sedimentary environment in Hambantota harbour is only exposed to lowest and moderate contamination levels of heavy metals.

Keywords: Inner and outer harbor, organic matter, sediments

Acknowledgement: *The support from Port Biological Survey Project conducted by Marine Environment Protection Authority is gratefully acknowledged.*

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