AN ASSESSMENT OF HEAVY METAL CONTAMINATION IN THE MARINE SEDIMENTS OF GALLE HARBOUR

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Heavy metals are one of the more serious pollutants in our natural environment due to their toxicity, persistence and bioaccumulation. Nine metal species (Cu, Hg, Pb, Ni, Cd, Zn, Fe, Mn, and Cr) were analyzed in the marine sediments of inner Galle harbour. Sampling sites were selected due to the prior consideration of the navigational, fisheries and city drainage activities. Due to the disturbed nature of the water column, sediment cores were used to collect the samples.

Microwave digestion and slurry preparation method were used independently for the sample preparation. Higher metal recoveries were obtained from the microwave digestion method. Analysis was done by flame and graphite furnace atomic absorption spectroscopic methods. Australian and New Zealand interim sediment quality guidelines (ISUG) were used to evaluate the sediment quality of the selected locations. Some sites had Ni and Pb concentrations higher than the ISQG value. Dramatically all the sediments were polluted with mercury. According to the metal pollution index, sediments collected from the entrance to the inner fisheries harbour was considered as the most polluted site of examined heavy metals. According to the mercury contamination, it was strongly recommended that the dredged sediments of the inner harbour should not be disposed to the sea without carrying out proper toxicological tests.

Toxicity Characteristic Leaching Procedure (TCLP) was carried out for assist the safe disposal of the sediments. Concentrations of the heavy metals in the leachates were below the TCLP guideline value. Hence the examined sediments can be used for the land filling operations safely.

However it is safe to monitor the other possible contaminants prior to the disposal of the dredged sediments. Also these obtained data can be used as a tool to develop a Sri Lankan sediment quality guideline which assures the safety of our environment more than foreign guidelines.