

## **Assessment of Heavy Metal Contamination in Negombo Lagoon and Achchankulam Estuary in Mannar District**

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Coastal water bodies such as lagoons and estuaries receive various types of pollutants due to anthropogenic influences resulted from rapid economic growth and urbanization. During the last decades, heavy metal contamination in aquatic systems has become one of the major problems due to its toxicity, durability and special depositional properties. Therefore, main objective was to study the concentrations of heavy metals to understand the levels of contamination in the water bodies of lagoon and estuaries situated in urbanized and industrialized areas of Sri Lanka. As such selected study sites were Negombo lagoon situated in Gampaha district and Achchankulam estuary situated in Mannar district. Water samples were collected in the wet season of 2015. The elemental concentrations of V, Mn, Fe, Cr, Co, Ni, Cu, Zn, As, Cd and Pb were measured in the 32 samples collected from Negombo lagoon and 10 samples from Achchankulam estuary using ICP-MS technique. In-situ measurements for the physico-chemical parameters of pH, conductivity, salinity and TDS were measured using a portable meter. The averaged metal concentrations obtained for 2 study sites were compared. All most all were remarkably high in the Achchankulam estuary except the V, Mn and Cu. The averaged Co, Ni and Zn showed 50% higher concentrations in Achchankulam than the Negombo. The As and Pb averaged concentrations were 75% higher and averaged Cd concentration was significantly higher as 216% in the estuary than the lagoon. The assessed Cr concentrations in both sites have exceeded the threshold level, 50.00 ppb; according to the proposed Ambient water quality standards for inland waters (Central Environmental Authority, 2001). Furthermore, this assessment showed that the averaged Cd concentration in the Achchankulam estuary extremely exceeded the threshold level, 5.00 ppb. The fresh water inputs of the lagoon is received from Attanagalu Oya and industrial zone in Ekala while estuary is receiving that from the second longest Malwathu Oya, which passes through 164 km of the agricultural farming lands to reach the coast of Mannar from Anuradhapura. So it may be possible that high Cd, As and Pb levels in the estuary may be a consequence of the higher utilization of fertilizer and agrochemicals which contain heavy metals as impurities, than other areas in Sri Lanka.

**Keywords:** Heavy metals, ICP-MS, contaminations, aquatic systems, lagoon and estuaries

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