

Executive Summary of Evaluated Final Report of the UGC Project

Title of the Project: Understanding depositional environments, metal concentrations and processes through the study of mudflats within Mandovi – Zuari Estuarine system, Goa

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Objectives:

- a) To study the distribution of sediment components viz. sand-silt-clay, clay minerals, organic carbon, metals within the mudflats in estuaries with space and time.
- b) To understand depositional environments; metal concentrations, processes, factors responsible for the distribution of sediment components and rate of sedimentation.
- c) To understand the growth of mudflats.

Comments of Evaluator:

- a) A total of 12 sediment cores were collected by using a hand driven PVC coring tube of 63mm diameter, from mudflats and mangroves in a grid pattern from lower and middle portion of Mandovi and Zuari estuaries along west coast of India. Standard protocols were followed in collection and analysis of samples.
- b) Distribution of sediment components, organic carbon and various metals namely Iron, Manganese, Copper, Zinc, Chromium, Cobalt were studied in both the estuaries with space and time.
- c) Using ternary diagram developed by Pejrup (1988), the hydrodynamic conditions prevailed during sediment deposition were classified to understand the depositional environment. Further, factors like waves, tides, currents, mixing between fresh and saline waters, pH and geomorphology, were discussed as responsible for the distribution sediments and metals. Further, role of Iron and Manganese were highlighted in regulating distribution of trace metals. Diffusion of Mn along with Cu and Zn from sediment to water column in Zuari estuary was related higher salinity.
- d) The study revealed that the middle estuarine region with quiet hydrodynamic condition facilitates deposition of finer sediments, organic matter and metals.
- e) The study concludes that mudflats within Mandovi and Zuari estuaries have developed in the changing hydrodynamic conditions from violent to quiet depositional environment. In the violent hydrodynamic conditions, coarser sediments settled down keeping finer sediments in suspension and movement. With changing time due to varying tidal and fresh water discharge, their interactions, hydrodynamic conditions changed to quieter environment which facilitated deposition of more fine sediments, organic matter which in turn trapped and retained higher metal concentration. Post depositional metal remobilization due to early diagenetic processes is clearly recorded in the mudflat sediments.

- f) The research project through the study carried out has established the process involved in the growth of mudflats.
- g) The report may please be placed under “**excellent**” category.