

Anthropogenic forces on distribution of heavy metals in the monsoon-dominated western continental margin of India

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Hazardous heavy metal concentrations and sediment accumulation rates measured by ^{210}Pb and ^{137}Cs , have been compiled to understand the impact of anthropogenic activities on monsoon dominated west coast of India. For the benefit of easy reference, the area of investigation can be divided into the northern Konkan Coast, the central Karnataka Coast and the southern Kerala Coast. Sediment accumulation rates increase from northern Konkan coast, through the Karnataka to Kerala coast (0.31-1.36, 0.38-1.91, and 2.9-3.8 $\text{g.cm}^{-2}.\text{yr}^{-1}$ respectively). Conversely ^{210}Pb inventories also show the same trend in sediments of these three coastal tracts (0.5-5.82, 2.21-13.82 and 39.2-67.5 dpm.cm^{-2} respectively). This suggests a southerly increase of land erosion perhaps be due to severe deforestation. The rates along the Kerala coast, particularly in Cochin Backwaters are considerably higher than that reported for other coastlines of the world, which could be ascribed as not due to the land erosion, but also due to dumping of solid wastes. In spite of high sediment accumulation rates, toxic heavy metals are remarkably higher in nearshore marine sediments bordering densely populated and industrialized cities like Bombay and Cochin. Toxic heavy metals like Cd, Pb and Zn are particularly higher in Cochin Backwater sediments (1.9-4, 40-284, 586-6296 ppm respectively) as compared to those in Mumbai estuarine sediments (1.7-6.1, 30-143 and 96-247 ppm respectively). Further, trapping of river-borne sediments together with contaminated heavy metals in the land-ocean margins. All these evidences indicate the dominance of

anthropogenic activities over the natural processes. Nevertheless, estuarine and marshy sediments along the Karnataka coast as well as inner shelf sediments off the West Coast of India these toxic metals are fairly within the background levels.