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## Geochemistry and Environmental Implications of Recent Sediments from a Tropical Urban Small Catchment River of Southern Western Ghats, India

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### Abstract

Textural and geochemical studies can give insights into the various geoenvironmental processes. In this study, analysis were performed for three different seasons on the modern sediments collected from Karamana River, a tropical lotic ecosystem in the Southern Western Ghats for assessing the natural and anthropogenic contribution of heavy metals. Unlike other rivers in India, Kerala Rivers are small and are severely degraded due to anthropogenic influences. Sediment pollution assessment was carried out employing three geochemical indices viz: Contamination Factor (CF), Pollution Load Index (PLI) and Enrichment Factor (EF). Since fine sediments tap the heavy metals, the studies in mud fractions will elucidate the geochemical conditions. Significant spatial variation in the distribution and concentration of heavy metals were observed in the riverine environment. The CF values of heavy metals especially Zn (6.05), Cd (7.45) and Fe (1.23) in the mud fraction were found to be higher when compared to the bulk sediments. The PLI values also clearly indicate relatively high load of pollution in mud fractions (0.76) compared to bulk sediments with 0.23. The mean EF values in mud fractions revealed high values for Zn (5.22) and Cd (6.85) suggesting moderately severe enrichment category. The Principal component analysis performed for bulk sediment samples, displayed 3 factor loading plots comprising the 11 variables of study revealing the geogenic and anthropogenic contribution of metals. This study can provide an insight into the anthropogenic influence observed in an urban riverine system.

*Keywords:* Geochemistry, Heavy metals, Karamana River, Sediment analysis, Contamination Factor, Pollution Load Index, Enrichment Factor

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