

Composition of deposited sediment and its temporal variation in a disturbed tropical catchment in the Kelantan River basin, Peninsular Malaysia

ABSTRACT

Pristine tropical river systems are coming under increasing pressure from the development of economic resources such as forestry and mining for valuable elements. The Lebir catchment, northeastern Malaysia, is now under development as a result of unregulated tree felling and mining for essential and rare metals. Two sediment cores, one in the upstream reaches and the other from the downstream reaches, were taken from flood prone area of the Lebir River, Malaysia, and analysed for their elemental composition by XRF, specifically Al, Si, Fe, Ca, K, Mg, Mn, V, Cu, Ni, Pb, Cr, Zn, As, Th and U. Activities of fallout radionuclides, ^{137}Cs and ^{210}Pb were also determined to from a geochronological context. The elemental concentrations in the soils were assessed in terms of their enrichment factor and Si, Ca, K, Mg, Mn, V, Cu, Ni and Zn were found not to be enriched, whereas As, Th and U had elevated enrichment factors. The Th and U were particularly enriched in the downstream core indicating inputs from a tributary that drains a catchment with known deposits of Th and possibly U. The results suggest that the growth in economic development is fostering the transport of contaminants by the major rivers which, in turn, is contaminating the riverine floodplains. This points to the need for a more integrated and holistic approach to river basin management to maintain the environmental quality of these fragile aquatic systems.