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Monitoring of tritium (H3) activity in water samples from aquatic environment of Kakrapar Atomic Power Station

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Tritium is a radioisotope of hydrogen and it is one of the constituents of liquid effluents released during normal operation of Kakrapar Atomic Power Station (KAPS) located near Surat in Gujarat. KAPS has two units of pressurized heavy water reactors which are operational since 1993. Water samples were collected and analyzed from twenty three locations covering the distance of less than 1.6 Km to more than 15 Km from the power station. These samples included upstream, lake water, downstream, canal and open well. Water samples were analyzed for measuring the tritium activity using Liquid Scintillation Spectrophotometer (Model No. Tricarb-3170). All the water samples except blowdown point showed the tritium activity below detectable level (< or=10 Bq/l). However water tritium activity shown in blowdown point was within the prescribed limit.

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Influence of scale on sediment dynamics and runoff response: A case study of the Thugela Basin in South Africa

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This study assessed the potential impact of hillslope soil erosion on downstream water quality using 15 microplots (of size 1 m^2), 10 plots (10 m^2), microcatchment (2.3×10^5 m^2), subcatchment (1.0×10^6 m^2), catchment (1.0×10^7 m^2) arranged in a nested design within a basin (2.9×10^{10} m^2). Total rainfall during the study period, 1st October 2012-30th October 2013, was 783.4 mm from 55 rainstorms. On average, unit-area runoff (R) increased from 9.3 L m-2 at microplot to 13.9 L m-2 at plot scale, followed by a drastic decline to 4.2 L m-2 at microcatchment scale. The R values along the mainstream were negligible in comparison to the hillslope. The decline of R from local (microplot and plot) to microcatchment level was attributed to infiltration losses. However, higher cumulative R at microcatchment was much greater than at microplot and plot scales, suggesting that subsurface-pathway was a very important conduit of water from the slope to the mainstream. The hillslope R variability were accompanied by an initial increase of average unit-area sediment loss (SL) from microplot (4.2 g m-2) to plot (26.3 g m-2), followed by a decline to negligible levels in the mainstream. Although direct transfer of water and sediments from the slope was negligible, the high cumulative R at microcatchment scale may be accompanied by high levels of dissolved pollutants, which may still impair downstream water quality. Therefore, further research on the pollutants is recommended. Immediate local level erosion control strategies are also needed to combat sediment transfer to the stream.

Biography

Macdex Mutema is a third year PhD Hydrology student at the University of KwaZulu-Natal, Republic of South Africa. He is working on a project that aims at evaluating the impact of land use and water harvesting on soil carbon and nutrient losses from soils and their fluxes at different spatial scales. He holds an Honours degree in Agricultural Engineering and Master of Science degree in Soil and Environmental Management from the University of Zimbabwe. He has a passion in soil and water management and conservation issues. He has 9 years' experience working with farmers in soil and water conservation projects.

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