Determination of selected heavy metals in river Mukurumudzi to establish potential contamination from land based activities and sources

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Rivers are the major sources of water used in cities and its suburbs. This water may either be treated or untreated. River banks could be very busy, with varied activities ranging from farming to industries and other domestic household activities. The present study aimed at investigating the concentration of heavy metals in river Mukurumudzi, Kwale County. Water and sediments were sampled in four points along the river impacted by mining, human settlements and agricultural activities for three different seasons. The samples were analyzed for Fe, Pb, Cd, Cu and As using an atomic absorption spectrophotometer (AAS). Sediment quality was also analyzed by the determination of contamination factor (CF) and Index of geo-accumulation (I-geo) values. Results were interpreted using Minitab statistical software and Excel spreadsheets. The concentration range of metals in water during the dry season was Fe (0.19-0.32) mg/l. Pb, Cu, Cd and As were BDL. The range of metals in sediments during dry season was Fe (0.13-1.44) ppm. Pb ranged (0.08-0.54) ppm. All other metals were BDL. The range of metals in water during the short rain was Fe (0.12-1.25) mg/l and BDL for all other analyzed metals. The CF values for sediments were all <1 indicating low contamination. I-geo values of metals in sediments were all <1. This suggested that the sediments were practically unpolluted. The concentrations of metals in water were all within the NEMA, KEBS and WHO recommended limits thereby indicating non-contamination. The results showed that there is a low concentration of the selected heavy metals in River Mukurumudzi.