

Impact of agronomic inputs in sugarcane farming on total heavy metal levels in aquatic ecosystems and soils within Lake Victoria Basin, Kenya

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Abstract

Sugarcane farming has been identified as the single most cultivated cash crop in Lake Victoria basin. Use of high agronomic inputs is employed in these regions for better yields. Most rivers feeding Lake Victoria from these catchments have been reported to accumulate total heavy metals downstream above background concentrations. The source of these heavy metals to the rivers is not known. This study, therefore, aimed at determining levels of pH, Cd, Cu, Zn, Pb and Cr in River Kuywa surface water and sediments before and after traversing sugarcane farms within Lake Victoria basin as well as in farm soils, canals runoff water and sediments within the sugarcane farms to assess if agronomic input in sugarcane farming influenced their levels. The results indicated significant differences at $p \leq 0.05$ in the heavy metal levels of River Kuywa before the farms and after the farms. Canals water and sediments levels were significantly higher than river water levels suggesting them to be the main contaminants to the river. In addition canals values differed significantly from the control canal implicating agronomic inputs over the increase. However, soil levels did not differ significantly from their control with all the values going beyond international standards suggesting the area to have higher background concentrations of these metals. None the less, soil pH and total organic carbon values differed significantly between the sugarcane farms and the control implicating agronomic inputs in sugarcane farming over their increase that aided in mobility of the naturally occurring metals to the aquatic systems.

Key words: *Lake Victoria catchment; sugarcane farming; River Kuywa; heavy metals; agronomic inputs; Kenya.*