

Assessment of heavy metal pollution in ground water near proximity of south bank canal, Tamil Nadu, India

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ABSTRACT - A study has been carried out on heavy metal contamination of groundwater with respect to cadmium, manganese, zinc, copper and lead in the south bank canal between Karur and Tiruchirappalli districts, Tamil Nadu, India. Heavy metals in groundwater are estimated by using Atomic Absorption Spectrometer, Perkin Elmer AA 200. Univariate statistics along with skewness, kurtosis and 't' test have been employed to test the distribution normality for each metal. The study reveals that the groundwater of the area is highly contaminated with cadmium. A good number of samples are also found to contain manganese at an alert level. The concentrations of copper and zinc in the groundwater of the area are within the guideline values of WHO. Statistical results show that all the metals under study exhibit an asymmetric distribution in the area with a long asymmetric tail on the right of the median. Keeping in view of the high concentrations of cadmium and manganese, it is suggested to test the potability of groundwater of the area before using it for drinking.

Key words - Cadmium, Manganese, Lead, Skewness, Kurtosis, t-Test

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Water plays an essential role in human life. Although statistics, the WHO reports that approximately 36 per cent of urban and 65 per cent of rural Indian were without access to safe drinking water. Fresh water is one of the most important resources crucial for the survival of all the living beings. It is even more important for the human being as they depend upon it for food production, industrial and waste disposal, as well as cultural requirement. Human and ecological use of ground water depends upon ambient water quality. Human alteration of the landscape has an extensive influence on watershed hydrology [1]. Heavy metal contamination of groundwater more often not goes unnoticed and remains hidden from the public view. Presently, it has raised wide spread concerns in different parts of the world and results reported by various agencies have been alarming [2,3]. There is also evidence of prevailing heavy metal

contamination of groundwater in many areas of India [4-6]. Trace amounts of heavy metals are always present in fresh waters from terrigenous sources such as weathering of rocks resulting into geo-chemical recycling of heavy metal elements in these ecosystems [7]. Contaminants such as bacteria, viruses, heavy metals, nitrates and salt have found their way into water supplies as a result of inadequate treatment and disposal of waste (human and livestock), industrial discharges, and over-use of limited water resources [8]. In this work, concentrations of cadmium, manganese, zinc, copper and lead ions in drinking water samples from water sources in these communities were determined by using standard analytical methods. Correlations between the metal concentrations were investigated. The monitoring of groundwater quality has been universally recognized as the quality of ground water cannot be restored once it is contaminated, by stopping the flow of