

Groundwater quality assessment for agricultural purposes at Vellore District of Southern India: A geospatial based study

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ABSTRACT

Identifying the geographical distribution of contaminants and their severity in polluting water are critical components of water resources management. Untreated industrial effluents cause severe groundwater pollution and health hazards worldwide. Therefore, the present study was carried out in the year (2019–2020) to assess the groundwater quality in the industrial areas of Vellore district, Tamil Nadu, India. Sixty-four groundwater samples were collected from different villages and analyzed. Spatial distribution maps were prepared to evaluate groundwater quality. The results revealed that among the various heavy metals, total Cr (140 mg/L) contamination was higher in the groundwater samples and hazardous for human consumption and irrigation purposes as per the permissible limit of chromium prescribed by WHO (0.05 mg/L). It is observed that the concentration of heavy metals decreases in the following order: Cr > Ni > Pb > Cd. The irrigation quality index was found to be high in Walajah Taluk in the order of Residual Sodium Carbonate < Magnesium Hazard < Permeability Index < Sodium Absorption Ratio. Regular monitoring of pollutants and appropriate remediation must be followed to avoid deterioration of groundwater quality. This study's findings can help to determine the best course of action to safely use groundwater for irrigation purposes in the Vellore District of India.