

AN APPROACH TO EVALUATION OF GROUNDWATER QUALITY MAPPING IN THE CHINNAR WATERSHED, CAUVERY RIVER, TAMIL NADU USING GEOSPATIAL TECHNIQUES

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Abstract

Chinnar is one of the main tributaries of river Cauvery located in Tamil Nadu state. It lies between Latitudes $12^{\circ}45'27.2''$ N and $12^{\circ}04'23.62''$ N Longitudes $77^{\circ}36'21.42''$ E and $78^{\circ}04'24.12''$ E and covers an areal extent of 1,592 Sq.Km. Entirely in the Krishnagiri and Dharmapuri districts of Tamil Nadu. Groundwater which plays a vital role is assessed for its domestic and irrigational suitability. Fifty seven representative groundwater samples were collected from dug and bore wells in pre-monsoon and post-monsoon seasons, tapping shallow to deep aquifers in charnockite, granitic gneiss, pyroxene granulite, syenite and ultra-basic rocks. The groundwater samples were analyzed for the major cations Na^+ , Ca^{2+} , Mg^{2+} , K^+ , and the anions Cl^- , HCO_3^- , CO_3^{2-} , SO_4^{2-} , NO_3^- and F. Important constituents that influence the water quality for irrigation are Total Dissolved Solids (TDS), Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR), Residual Sodium Carbonate (RSC) and Permeability Index (PI). These parameters were compared with World Health Organization (WHO) standard limits. Majority of the samples were found to be within the safe limit suitable for domestic and irrigational purposes. United States Salinity Laboratory (USSL) plot indicates most of the samples falling in C2S1, C3S1 domain and hence suitable for irrigational purposes. The Doneen's Permeability Index plot shows samples in Class I and Class II category indicating that groundwater in the study area is good for irrigational purposes in both the seasons.

Keywords: Water quality Doneen's Permeability Index (PI), Groundwater, Residual Sodium Carbonate (RSC), United State Salinity Laboratory (USSL).