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HYDROGEOCHEMISTRY OF MAILAM BLOCK OF TINDIVANAM TALUK, VILLUPURAM DISTRICT, TAMILNADU

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Abstract

Geochemical signatures of groundwater in the Hardrock Aquifer of Mailam block which forms a part of Tindivanam Taluk, Villupuram district, Tamil Nadu, India, were used to identify the chemical processes that control hydrochemistry. The study area covering an area of 285 sq.km which lies in the northern part of Tamil Nadu forms a part of Tondiyar basin. The area also includes a number of rainfed tanks and streams. It serves as a source for groundwater to irrigate the area. The present study is about geochemical characterization of groundwater, its suitability for drinking, domestic and irrigational purposes. About 32 groundwater samples were collected for this purpose from the study area and all the samples underwent geochemical analysis for various water quality parameters such as pH, Electrical conductivity (EC), TDS, and major ion concentrations Na, K, Ca, Mg, Cl, HCO3, SO4. All the analytical values were computed by employing HYCH (a computer programme) for ionic balance of analytical values. Based on HYCH output all the groundwater samples were evaluated for suitability for drinking, domestic and agricultural purposes. The geographic information system-based spatial distribution map of different major elements was prepared using ArcGIS 9.2. In comparison with WHO(1993) and IS-10500(1991) for the permissible limit of drinking water, a majority of the ground water samples in the study area fall within the maximum permissible limit. Some on the basis of TDS and due to hardness of the groundwater did not meet the permissible limit for domestic purposes. Other chemical parameters such as Sodium Adsorption Ratio, percentage of sodium etc. which were calculated to determine the suitability of groundwater for irrigational purposes were found to be good. In the Gibb's diagram, majority of the samples fall under rock dominance field and little under Evaporation field.

Keywords: Hardrock, Tondiyar basin, HYCH, Irrigation, Evaporation, Hardness.