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GROUNDWATER QUALITY CHARACTERIZATION IN PARTS OF SRIKAKULAM DISTRICT, ANDHRA PRADESH

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Abstract

Assessment of the suitability of groundwater for domestic and agricultural purpose was carried out in parts of Srikakulam District, Andhra Pradesh. The study area covers an area of 330 km2 and lies in a semiarid region. Groundwater is the major source for domestic and agricultural activity in this area. Groundwater samples were collected from 70 representative borewells/handpumps/dugwells during pre-monsoon period in the year 2012 and were analysed for major ion concentration to determine the quality variation. The groundwater quality was examined in perspective of Indian as well as World Health Organization's drinking water standards. Based on the analytical results, groundwater in the study area is found to be fresh to slightly saline and soft to very hard. The average abundance of the major cations and anions is in the order of: Na > Ca > Mg > K and HCO3 > Cl > SO4 > NO3 > F respectively. The dominant hydrochemical facies of groundwater is Ca-HCO3-Cl, Ca-HCO3 and Ca-Na- HCO3-Cl type. Rock-water interaction diagrams indicate precipitation induced chemical weathering along with dissolution of rock forming minerals. Suitability of groundwater for irrigation was evaluated based on salinity hazard, sodium percent, sodium adsorption ratio, residual sodium carbonate, US salinity diagram, Wilcox's diagram, Kelly's ratio and permeability index. Assessment of groundwater samples from various methods indicated that the majority of groundwater samples in study area are chemically suitable for both drinking as well as agricultural use.

Keyword: Hydrogeochemistry, Groundwater quality, Srikakulam District