

IDENTIFICATION OF REPRESENTATIVE SAMPLING SITES FOR MONITORING OF GROUNDWATER QUALITY IN SRIKAKULAM DISTRICT, ANDHRA PRADESH

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Abstract

An attempt has been made for the identification of representative sampling sites, using principal component analysis (PCA), for monitoring of groundwater quality in Srikakulam District, Andhra Pradesh. From the results of PCA, two principal components (PC1 and PC2) have been extracted, in order to explain ~ 78% of the total variation in the quality of groundwater. The PC1 has strong positive loadings (>0.75) on pH, EC, TDS, Na⁺, HCO₃⁻, Cl⁻, SO₄²⁻, NO₃⁻ and F, and the PC2 on TH, Ca²⁺ and Mg²⁺. PC1 and PC2, are considered as multi-controlled process (related to alkalinity, pollution and salinity) and hardness controlled process (related to carbonate hardness), respectively. Sampling sites having higher positive scores (>1.0) observed from PC1 and PC2 are selected as representatives of the entire study area for regular monitoring of groundwater quality. They reduce not only the sampling size, but also the expenditure incurred during the monitoring programme.

Keywords: Groundwater Quality, Principal Component Analysis, Representative Sites