

GROUNDWATER QUALITY ASSESSMENT FOR IRRIGATION USES OF BANKI SUB-DIVISION, ATHGARH BASIN, ORISSA, INDIA

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Abstract

A study on geochemical characterization of groundwater and its suitability for irrigation purpose was carried out in Banki Sub-division of Orissa. 53 groundwater samples were collected from open wells and bore-holes during the pre-monsoon period. Quality assessment is made through the estimation of Ca^{2+} , Mg^{2+} , Na^+ , K^+ , Cl^- , SO_4^{2-} , CO_3^{2-} , HCO_3^- , total hardness as CaCO_3 , TDS, EC, and pH. Based on these analyses, the irrigational parameters like sodium adsorption ratio, % sodium, residual sodium carbonate, non-carbonate hardness, potential salinity, Kelley's ratio, magnesium ratio, and permeability index were calculated to determine the suitability of groundwater for irrigational purpose. The groundwater falls under (Doneen's) class I and excellent to good (Wilcox) zone indicating its suitability for irrigation use. Groundwater in the area is generally saline and an increasing problem of bicarbonate is marked. Various classifications show that present status of groundwater is better for irrigation purpose except for a few locations with a caution that it may deteriorate in near future.

Keywords: Irrigation, Salinity, Doneen's, Wilcox, Sodium Absorption Ratio, Residual Sodium Carbonate.

