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Appraisal of Hydrochemical Quality of Groundwater in Bamanghaty Subdivision of Mayurbhanj District, Odisha, India Using Geospatial Technology

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Abstract

Geochemical attributes of groundwater were investigated in the Bamanghaty Subdivision of Mayurbhanj District, Odisha, India using geospatial technology. The assessment was undertaken to depict the suitability of water for drinking and irrigation use. Geospatial technology is reliable and cost-effective to measure the quality of groundwater in Precambrian hard rock terrain. Around 14 groundwater samples were collected arbitrarily from various sources such as hand pumps, tube wells and bore wells. Major ions were analysed to understand the influence of geochemical processes on groundwater quality in the Bamanghaty subdivision. Samples were tested for pH, Electrical Conductivity, Carbonate, Bicarbonate, Chloride, Sulfate, Nitrate, Calcium, Magnesium, Sodium, Potassium and absolute hardness. Based on the results of the chemical analysis of water samples, various graphical representations were made, viz. Ionic concentration diagram, Stiffs' diagram, Permeability index diagram, Salinity hazard diagram and Piper's trilinear diagram. The chemical properties of groundwater were analysed to decipher its suitability for drinking and irrigation use. Investigation demonstrates that most of the groundwater is chemically suitable for drinking and agricultural uses.

Keywords: Groundwater; Chemical Analysis; Geospatial Technology; Permeability Index; Salinity Hazard Index; Piper Diagram.

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