

Hydro-Geochemistry and Groundwater Quality Assessment of Rajshahi City in Bangladesh

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Abstract : The study was carried out to understand the hydro-geochemistry and ground water quality in Rajshahi City of Bangladesh. 240 groundwater (shallow and deep tubewell) samples were collected during the year 2009-2010 covering pre-monsoon, monsoon and post-monsoon seasons and analyzed for various physico-chemical parameters including major ions. The results reveal that the groundwater was slightly acidic to neutral in nature, total hardness observed in all samples fall under hard to very hard category. The concentration of calcium, iron, manganese, arsenic and lead ions were found far above the permissible limit in most of the shallow tubewells water samples. The analysis results show that the mean concentrations of cations and anions were observed in the order: Ca > Mg > Na > K > Fe > Mn > Pb > Zn > Cu > As (total) > Cd and HCO₃⁻ > Cl⁻ > SO₄²⁻ > NO₃⁻, respectively. The concentrations of TH, TDS, HCO₃⁻, NO₃⁻, Ca, Fe, Zn, Cu, Pb, and As (total) were found to be higher during post-monsoon compare to pre-monsoon, whilst K, Mg, Cd, and Cl were found higher during pre-monsoon and monsoon. Ca-HCO₃ was identified as the major hydro chemical facie using piper trilinear diagram. Higher concentration of toxic metals including Fe, Mn, As and Pb were found indicating various health hazards. The results also illustrate that the rock water interaction was the major geochemical process controlling the chemistry of groundwater in the study area.

Keywords : physio-chemical parameters, groundwater, geochemistry, Rajshahi city

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