

Toxicity assessment of groundwater quality in Bangladesh.

ABSTRACT

A study was conducted to assess long-term effect of ground water for irrigation at Chirirbandar upazila, 25 kilometers eastern from Dinajpur district in from February to April in 2006. All the waters were analyzed and classified into different categories for their suitability as irrigation, drinking and industrial usage. The chemical analyses were included pH, EC, TDS, Ca, Mg, Na, K, Fe, Cu, Mn, Zn, B, As, SO₄, P, HCO₃ and Cl. The SAR, SSP, RSC and HT were calculated for the research. The pH (6.55 to 7.75) showed slightly acidic to slightly alkaline. The TDS was rated as 'fresh water', EC and SAR were 'medium' (C₂) class and 'low alkali hazard' (SI) class which jointly expressed as C₃S₁. The study was found that SSP was in 'excellent' category. Waters were free from RSC and belonged to 'suitable' category for irrigation. The waters were classified as 'hard' and 'very hard' based on hardness (HT). It was found that both Fe and Mn content of all samples were not having problem for industrial usage. Boron was identified as 'suitable' for drinking consumption and sulphate was 'suitable' for drinking and industrial usage. The relationship of pH vs. EC, pH vs. TDS, EC vs. TDS, EC vs. HT, TDS vs. HT, SAR vs. SSP, SAR vs. RSC, and SSP vs. RSC indicated significant positive correlation. Among the quality determining factors SSP and SAR were highly correlated where correlation coefficient was 0.964.

Keyword: Toxicity; Groundwater Suitability; Irrigation and drinking consumption.