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Quality Criteria for Groundwater Use from a Part of Wanaparthy District, Telangana State, India

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Abstract

The study was carried out in a part of Wanaparthy district, Telangana State, India, to assess the groundwater quality for drinking, irrigation and industrial purposes. Groundwater samples collected from the study area were analyzed for pH, electrical conductivity (EC), total dissolved solids (TDS), calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^+), potassium (K^+), bicarbonate (HCO_3^-), chloride (Cl^-), sulphate (SO_4^{2-}), nitrate (NO_3^-) and fluoride (F^-). The quality of groundwater shows an alkaline condition with a dominance of Na^+ and HCO_3^- ions. The values of chemical parameters were compared with the drinking water quality standards and found that the TDS, Mg^{2+} , Na^+ , Cl^- , SO_4^{2-} , NO_3^- and F^- are more than their recommended limits in most groundwater samples. Irrigation water quality was assessed with respect to alkali hazard (SAR), salinity hazard (EC), percent sodium ($\% \text{Na}^+$), permeability index (PI), residual sodium carbonate (RSC), magnesium ratio (MR) and Kelly's ratio (KR). Most groundwater samples are not suitable for irrigation except based on RSC parameter. According to the TDS, HCO_3^- , Cl^- and SO_4^{2-} , the groundwater in a few samples causing incrustation and corrosion is unfit for industrial purpose. Therefore, groundwater quality management measures were suggested to improve the water quality.

Keywords: Groundwater quality, Drinking, Irrigation purpose, Industrial use, Management measures, Telangana State.