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ASSESSMENT OF WATER QUALITY IN AND AROUND HINGNA AREA OF NAGPUR DISTRICT, MAHARASHTRA FOR IRRIGATIONAL PURPOSES

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Abstract

The paper examines the quality of water in parts of Hingna area of Nagpur district, Central India for its irrigational suiatability. For this purpose, a total of twenty two (22) water samples from dugwell (7), borewell (11) and stream (4) were collected and analysed for major ions. The abundance of major ions show $Ca^{2+} > Mg^{2+} > Na^{+} > K^{+} = HCO_3^{-} > Cl^{-} > SO_4^{2-} > F^{-} > NO_3^{-}$ in case of borewell samples, and $Mg^{2+} > Ca^{2+} > Na^{+} > K^{+} = HCO_3^{-} > Cl^{-} > SO_4^{2-} > F^{-} > NO_3^{-}$ in case of dugwell and surface water samples respectively. The hydrochemical investigation of surface and subsurface water indicates the Ca^{2+}-HCO_3^{-} type water predominantly. The important constituents, influencing the water quality for irrigation *viz.* electrical conductivity (EC), total dissolved solids (TDS), sodium percentage (Na%), sodium adsorption ratio (SAR), Kelley's ratio (KR), magnesium adsorption ratio (MAR), permeability index (PI), chloroalkaline indices (CAI), bicarbonate hazards and residual sodium carbonate (RSC) were determined and compared with the different irrigation water quality classification systems. The study reveals that all the groundwater samples (except one) are suitable for the irrigational purpose. The groundwater pollution, resulted due to the industrial effluents, is clearly observed in case of one of the borewell water sample showing high content of EC, TDS, Alkalinity, Ca^{2+}, Mg^{2+}, TH, Na^{+}, HCO_3^{-}, SO_4^{2-} and Cl^{-}. The same polluted water, if used for irrigation, may cause severe problems to the soils and crops and therefore it is recommended to avoid the same water for irrigation practices.

Keywords: Hydrochemistry, Irrigation water, Water quality, Hingna, Nagpur, Central India.