

ANALYSIS OF GROUNDWATER QUALITY PARAMETERS IN BARSHI URBAN AREA, SOLAPUR DISTRICT, MAHARASHTRA

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Abstract

Barshi urban town, a Taluka Headquarters in Solapur district of Marathwada region in Maharashtra has a unique identity and significance due to its local market place (Gujri Bazar) and religious fair (yatra). Increasing and stress of floating population has put additional burden on natural resources like land use, water, food grains and public amenities. To study the impact of urbanization on water especially groundwater, hydrogeological survey was carried out considering all the aspects of a developing town. 24 groundwater (dug well) samples were collected during pre-monsoon to determine the shallow aquifer groundwater quality, while 21 hand pump or bore well samples were collected during post-monsoon to assess the deeper groundwater quality. It was observed that concentration of nitrate was 1.11 to 3.84 times higher than the maximum permissible limit (MPL) of the BIS (2012) standard of 45 mg/L, indicating influence of anthropogenic activities in these areas. Such a contamination was further corroborated by the high concentrations of chloride, as both nitrate and chloride are normally integral parts in domestic sewage. Currently, about 50% of groundwater samples show nitrate concentrations above BIS (2012) standards. Majority of the groundwater samples are dominated by alkaline earths (Ca^{++} & Mg^{++}) and strong acids (SO_4^{2-} & Cl^-). In basaltic aquifers, the groundwater is of Ca/Mg- HCO_3 type. The chemical analysis data also exhibit the impact of increased anthropogenic inputs on groundwater quality and change in the nature from a purely basaltic Ca/Mg- HCO_3 type of groundwater to a mixed Ca/Mg- Cl_2 (75%) type, Ca/Mg- HCO_3 (16.7%) and Na- Cl_2/SO_4 type (8.3%) of groundwater water. The periodic groundwater sample analysis, adoption of recharge measures, proper disposal of sewage coupled with awareness about health and groundwater are a few suggestions for mitigation of groundwater pollution.

Keywords: Barshi town, Hydrochemistry, Basaltic terrain, Nitrate pollution