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HYDROGEOCHEMICAL INVESTIGATION AND GROUNDWATER QUALITY ASSESSMENT OF THE KARANJA RIVER BASIN (KRB), BIDAR DISTRICT, KARNATAKA, INDIA

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Abstract

Hydrogeochemical studies were carried out in the Karanja River Basin (KRB) to assess the quality and suitability of groundwater for drinking and irrigation purposes. Fourty two groundwater samples were collected during pre-monsoon and post-monsoon seasons of 2015. The physico-chemical parameters of groundwater such as pH, EC, TDS, Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, HCO_3^{-}, Cl^{-}, SO_4^{2-}, NO_3^{-} were determined. In the majority of water samples, the analyzed physico-chemical parameters fall within the desirable limits and suggest their portability for drinking use as per the standards set by WHO (2011), BIS (2012), and ISI (1983) standards. The Piper's (1953) trilinear diagram (1953) plotted for the chemical data reveals that the majority of the groundwater samples are mainly Ca-HCO_3 and mixed Ca-Na-HCO_3 type during both pre-monsoon and post-monsoon seasons. According to Gibb's (1970), diagrams the overall hydrochemistry of the groundwater samples in both seasons falls in the rock dominance field. The values %Na, SAR, and RSC were calculated for the present study area to interpret the water quality from an irrigational point of view. Wilcox (1954) and USSL (1954) plots along with the values of RSC revealed that groundwater samples from both seasons are suitable for irrigation purposes. The majority of the water samples analyzed during pre-monsoon and the post-monsoon seasons have the %Na, SAR, RSC, etc., values within the prescribed limit. Hence, in the present study area, the groundwater samples are suitable for drinking and irrigational purpose, except a few samples.

Keywords: Hydrogeochemistry, Groundwater Quality, Karanja Basin, Bidar.