

Assessment of ground water resources in Kirana Hills Region, Rabwah, District Chiniot, Pakistan

Mirza Naseer Ahmad; Rashida Sultana; Maria Salahuddin and Syed Jaleed Ahmad
Abdus Salam School of Sciences, Nusrat Jahan College, Rabwah, Pakistan
nmirza@njc.edu.pk

Abstract

This study was planned to assess the groundwater quality of the area adjacent to Precambrian Kirana Hills, Pakistan. The majority of the people in the area use groundwater from private wells for drinking and domestic use. Therefore, it is important to provide an overview of the groundwater quality. This information would be beneficial to local people and the administration for selecting suitable water treatment methods. Samples were collected from different wells of Rabwah town, close to the Kirana Hills. Parameters like EC, pH, alkalinity and total dissolved solids (TDS) were determined for 142 samples. While 40 samples were analyzed for hardness, Ca, Mg, Cl, SO₄, NO₃, and F. Standards set by the World Health Organization (WHO) were considered to evaluate the quality of groundwater. Geographic Information System (GIS) was used to interpolate analyzed physicochemical parameters. The results showed that EC, TDS, hardness, Cl, SO₄, and Ca were very high in the water samples of the area. Fifty-two percent of samples had pH values lower than the permissible limits. Results suggest that the water quality is extremely adverse close to the hills. The poor water quality adjacent to the hills may be due to the limited recharge of aquifers because of the hills and shallow basement. The hills and shallow basement may act as a barrier to subsurface water movement. Some physical and chemical parameters indicated that the quality of water at deeper levels (i.e. >150 ft) is relatively better. This may be due to limited exploitation of water from deeper aquifers as compared to shallow aquifers. Hence, proper aquifer management is required to prevent water quality deterioration due to over-exploitation. Nitrate (NO₃) was found within the acceptable limits. Therefore, water samples were free of any significant contamination by human activities.