A GEOSTATISTICAL APPROACH FOR THE ASSESSMENT OF GROUNDWATER TABLE IN KARAK VALLEY BY USING GIS TOOLS AND TECHNIQUES

Ihsanullah, Naseem Ahmad and Tahir Waqas
Department of Geography, University of Peshawar
ihsanullah@upesh.edu.pk

Abstract

Groundwater is extensively used for irrigation as well as drinking purpose in Karak valley, District Karak. There is a serious threat to the depletion of water table which may ultimately lead to serious shortage of water for drinking in the study area. A study was conducted to assess the dynamics of groundwater table. For this purpose data of 72 sample wells/tube wells/boreholes were randomly collected in the study area in December, 2015. Temporal data of 1984 collected by TNO Netherland for WAPDA and 2009 data collected by Water Management Department, Agriculture University Peshawar were used in the analysis. The Geostatistical interpolation techniques were used to calculate the surfaces of water table for each year. The overlay analysis were carried out over the temporal data for change detection in water table. To find out the impact of geology on water table, the water table layers were overlaid with geology layer of the area. The results show that currently the water table of the study area can be classified into three class's i.e. (1) high (2) moderate (3) low. It was determined that the water table in northeastern part of the study area near the Zaibi dam has high water table in comparison to rest of the valley. While areas in the southeast near the Shinghar Range have deep water table. The water table deepens towards the west of the valley near Karak town at valley entrance. The temporal changes in the water table from 1984 to 2016 revealed that overall the water table is showing a drawdown or stable. However, the area surrounding Zaibi dam and areas south of Zaibi dam across the valley show recharge. Similarly areas surrounding Karak Town also show some recharge. The impact of geology can be appreciated from the results as it reveal that the water table is lower in the Dhok Pathan formation in comparison to the Quaternary Alluvium due to its permeable nature.