

IMPACT OF CLIMATE CHANGE ON THE RENEWAL OF UNDERGROUND WATER RESOURCES (CASE HYDROGRAPHIC BASIN CHÉLIFF-ZAHREZ)

Mohamed MEDDI, A. BOUCEFIANE

Abstract :

The aims of our work is the study of the impact of climate changes on the renewal of the groundwater in the Chélif-Zahrez watershed. It is based on analysis of the relationship between the evolution of rainfall and the piezometric head. The relationship between rainfall patterns and fluctuations piezometric level of the water will be analyzed. The aquifer of Uper Chellif, Middle Chellif, Lower Chellif and Mina is the most important one in the studied area. Groundwater is the most important resource used in the watershed Cheliff-Zahrez. The renewal of the resource depends on the groundwater recharge which is a function of rainfall and following evapotranspiration. An increase in evaporation and evapotranspiration, the increase in temperature would lead to a decrease in recharge and would have a direct impact on the level and quality of groundwater. Several recent studies have shown that the climatic trends are well correlated with changes in the groundwater level.

The studied area encompasses two watersheds : the basin of Cheliff in the North and the basin of Zahrez-Sersou in the south. The climate of the region is semi-arid to temper. The rainfall pattern has undergone a change from the seventies. Thus, the emergence of a rainfall deficit from 1970 and the continuation of this diminution in precipitation over the last decade of the last century. The rain diminishes with distance from the Mediterranean sea, with a little degradation of rainfall from east to west, the wettest region is the north east of the basin. Wich is characterized by an important elevations and its exposure to the wet wind of the North. The annual average rainfall varies from 600 to 700mm. On the plains, the rains are less than 500mm, in the south of the Cheliff-Zahrez basin, High-plateaux and Zahrez, the annual averages rainfall varies from 100 to 300mm. A filter of moving averages over 3 years has been applied to highlight the main trends. The resultants found show that the periods 1980-1994 and 1998-2001 are characterized by a significant deficit in rainfall recorded on the various stations. Thus, the annual average rainfall recorded was below the average reported for the period 1968-2001. Generally, the piezometric analysis have shows that the variations of the piezometric levels of Chelif valley reflect, faithfully, the pluviometric evolution recorded in the rainfall stations of Ghrib, El Khemis, Chlef and Relizane. With certain time lag. The response of the water level to the climatic variations requires a period, depending on the hydraulic conductivity, the storage of the aquifer, and also on the distance between the recharge zone and the point of observation. We have seen a marked decrease in the level of the water since 1997, with a decline of 0.5 to 1m.

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