

CHANGE IN THE HYDROLOGICAL REGIME OF THE MACTA BASIN IN THE NORTHWEST OF ALGERIA

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Abstract:

The precipitations determine the variability or, better, the irregular Inter seasonal and inter annual surface runoff. The study of the flow and the rainfall series from 1941 to 2001 is used to evaluate the sensitivity of oueds to climate change.

In order to better assess the impact of climatic factors on the hydrological regime, the Macta basin which is situated in the North-West of Algeria. Which covers an area of 14380 km² has been selected. The inter-annual hydroclimatological changes are characterized from the annual average flows of the various stations of the two basins components of the Macta. The method adopted is that of difference between the annual average flows and the Inter-annual average flow. Eight class of the flow whose boundaries correspond to the level of humidity based on the degree of the difference between the annual mean flow and the annual average flow were established. There is a major difference between the two hydrological regimes of the West part (oued Mekerra) and the East part (Oues El Hammam). It is mainly due to the mountain crest relaying South-West to the North-East with a maximum of 1400 m locally. In the south, the limits of the basin constitute a real natural climatic threshold separating two opposing rainfall regime. Through the comparison of specific discharge, we distinguish that the average flows of Oued Mekerra varies between 1.74 and 11 m³ /s, while those of the Wadi El Hammam are between 27.5 and 44, 3 m³ /s. The potential is estimated at more than 260 Hm³. In a perennial scale, changes in hydrological regimes reveal a generalized trend of irregularities. The climatic irregularities were investigated through the annual variations of the climate mean coefficient and its moving average calculated over 3 years. The results for the period 1949-2001, are similar to changes in average annual discharge measured at the downstream of the basin. Variations of this coefficient show that during the period between 1949 and 1963, the Macta basin has known a very important deficit episode followed by a surplus period not more than 3 consecutive years. During those two periods, there is also a year with exceptional rainfall:1950-1951 with a surplus of 170%. From 1972 to1973, a very dry period of more than 19 years was installed in the basin with deficits ranging from 10% to 80%.

The study of the impact of climate change on water resources in the planning and conduct of the management of water resources in the studied basin and adjacent watersheds is a very important tool for policy makers.

Keys Words: Hydrological regime; climate Coefficient; Macta ; Algeria.