THE EFFECT OF LAND USE AND COVER CHANGE ON WATER RESOURCES IN SPAIN.(2)TEMPORAL CHANGES OF WATER BALANCE IN RIVER BASINS

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Most of the historical records of river discharges in Spain started in the first half of the XX century. Nowadays, after more than 50 years, decreasing trends of annual discharges can be observed in some of the large river basins, although the causes of these trends have not been yet sufficiently investigated. A revision of the information available for the Ebro river shows that, after considering the variability of climate and the increase of water consumption for irrigation, there is a remaining annual decrease of about 0.2% of the mean discharge that is to be attributed to changes in the water balance of the headwaters. This interpretation is consistent with the decrease of discharges from the main tributaries, observed upstream from the abstractions for irrigation. In some other river basins with headwaters below the tree line, temporal decreases of discharge are more marked and, independently of their origin, threaten the efficacy of strategic water management structures. In the light of the current knowledge of the hydrological role of vegetation, these changes in water balances should be primarily attributed to the known increase of forested areas in the catchments.