Hydrological Balance Implementation in Mendoza's Province. Decision Support and Modeling Tool for Integrated Management of Water Resources

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Abstract

The Province Constitution commands the development of Hydrological Balances (BH) in the basins of Mendoza Province, after a century the General Irrigation Department has implemented the BH programme in the frame of the Water Strategic Plan 2020. Up to now there was the presentation of the BH of the Superior Tunuyan River, that is developed herein as a study case. An integral and conceptual model was created, which considered the characteristics of the Administrative Management Units (AMU), the hydrological components and their interrelations. To define the decision rules, a prospective analysis method was selected and productive context and the climate change circumstances were also taken into account. As methodological strategies, the use of the hydrological model WEAP (Water Evaluation and Planning) was adopted because this tool allows assessments in different scenarios. An Actual Hydrological Balance (AHB) and a Programmed Hydrological Balance (PHB) were modelled. In the first case the present efficiencies, the registered cultivated lands and the coefficient of distribution currently used were taken into account. In the second case an estimated future analysis was done based on an assessed efficiency and on the registered cultivated lands. Future climate changes were taken into account, considering a decrease of the hydrological offer and an increase of this demand due to the higher temperatures. All the AMU exceeds the annual demand coverage in more than 85%. The results show that the values of the demand through the BHP reach the reference values acceptable in the irrigated semiarid regions.

Keywords: hydrological balance, WEAP model, reasonable efficiency, climate change, future analysis