Water resources management in semi-arid region impacted by climatic and anthropogenic scenarios using the WEAP model: case study of Merguellil watershed

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Abstract: Water scarcity in semi-arid region is the main factor limiting agricultural production also rainfall irregularity in time and space face to the continues increase of water demand of different sectors, all that has led to overexploitation of surface and groundwater resources mainly because of agriculture, and this is the case of Merguellil Basin situated in the central of Tunisia. The WEAP (Water Evaluation and Planning system) model was used to analyze the actual and future water balance of the Merguellil watershed, and to identify the evolution. The main objective of this study is to analyze climate and anthropogenic scenarios in Merguellil watershed, using remote sensing tools to estimate crop pattern. Climatic scenarios were tested for RCP4.5 and RCP8 scenario. Simulations show a rapid decrease of the water storage for the four aquifers in the basin especially for Kairouan aquifer under different scenarios. In addition, scenario combination between the increase of irrigated area and climatic scenarios will make the situation more difficult to manage by 2050.