ABSTRACT

The process of securing the supply of water needs is one of the biggest problems in the world. Algeria is one of the southern Mediterranean countries that suffer from water scarcity. The water flows are characterized by a significant seasonal and interannual irregularity and by violent and rapid floods. Indeed, knowledge of climatic conditions plays an important role in economic planning studies; it makes it possible to better control the uncontrolled inputs that lead to the proper functioning of the water resources forecasting and management system in the short, medium and long term. Mitidja is one of the most fertile plains of Algeria. It is the main reservoir of underground water covering the different water needs of many localities in the capital and several cities of four wilayas located in large parts of the plain (Algiers, Blida, Boumerdes, and Tipaza). They also irrigate tens of thousands of hectares of farmland. The Mazafran which is part of the plain watershed still has significant potential for exploitable water resources, both underground and surface.

Faced with the ever increasing water demand for the different users, water resource management organizations face many challenges, some of which may be a barrier to achieving sustainability and ensuring the water required for various supply sectors. To address this dilemma, integrated water resource management is a better approach. This study has modeled the integrated management of water resources in the Mazafran watershed by the Water Assessment and Planning System (WEAP). The latter was developed by the SEI (Stockholm Environment Institute) to simulate the current water balance and evaluate water resources management strategies according to two climate change scenarios (optimistic RC4.5 and pessimistic RC8.5) by 2050. The model was calibrated for the period (1998-2007) and validated for the period (2008-2014). The two scenarios constructed for this approach reflect the effect of future trends in water demand taking into account the different operating policies and the factors that can influence the demand and assess the impact of water availability by likely climate change in the study area.

The WEAP model simulations show that the total water demand of the region can be satisfied up to the year 2041 and from 2045, the water shortage will reach a maximum by 2050 with a volume of 95.3 Mm^3 for the optimistic scenario (RC4.5). This situation will be more serious for the pessimistic scenario (RC8.5) where the lack of water will trigger rather to know in 2025 and the deficit will be around 130.95 Mm^3 in 2050.

Keywords:

Water resources management, plane Mitidja, climate change, WEAP model, Mazafran watershed, North of Algeria .