Geophysical Research Abstracts
Vol. 13, EGU2011-11921, 2011
EGU General Assembly 2011

Drought adaptation scenarios to improve the water resource management and increase the food security in the Merguellil watershed.

Zohra Lilichabaane (1), Ines Oueslati (1), Marouen Shabou (1,2), Amri Rim (1,2), Mehrez Zribi (2), Diego Glafassi (3), Kaitlyn Rathwell (3), and Holger Hoff (3)

(1) Institut National Agronomique de Tunisie (INAT), 1082 Tunis-Mahrajène, Tunisia (Zohra.lili.chabaane@gmail.com), (2) Institut pour le recherche et le developpement (IRD), B.P. 4345, impasse Chahrazède 1004 El Menzah IV -Tunis - Tunisia, (3) Potsdam Institute for climate impact research (PIK), P.O. Box 60 12 03 14412 Potsdam Germany

Like several semi arid regions, the Merguellil watershed situated in kairouan region, central of Tunisia, is suffering from water scarcity and high variability of precipitation. The aquifer system of the kairouan plain is the main water resource for all water demand sectors: Agriculture, domestic, tourism, industry and coastal supply, followed by the surface water represented by El Houareb dam that can satisfy a very low portion of this demand.
The agriculture is the main consumer with about 80% of the total water resources because of the continuous increase and intensification of irrigated area. The irrigation sector is divided into public and private. While the public irrigated area is well controlled, the private one is totally unknown mainly in terms of water volumes pumped from the aquifer which is a heavy burden on the actual groundwater resources because of the increase of unlicensed wells. Therefore, a sustainable water management of the different resources is important in order to fill the gap between the irrigation water requirement and the existing water resources.
In this framework, The WEAP model (Water Evaluation and Planning system) was used to analyze the actual and the future (until 2050) water balance of the Merguelllil watershed and to find different strategies and scenarios that can assure the region economic and food security. The first task was the quantification of the irrigation water consumed by the private sector using remote sensing which showed to be a powerful tool for land cover monitoring. The land use map was built and then the irrigation water requirement of different crops was calculated using SAMIR model that computes spatialized estimates of evapotranspiration (ET) and irrigation water budget on large areas, based on the use of satellite images.
Results provided by WEAP show that the pressure on Merguellil water resources will increase leading to greater problems of unmet demand. Different solutions were tested such as integrated surface and groundwater management and change in crop pattern. This study illustrate that WEAP results can be considered as an appropriate tool for making drought adaptation strategies at local scales and helps the decision makers in developing their recommendations for actual and future water balance situations.