Predicting Groundwater Vulnerability to Climate Change by Using a Coupled Catchment Hydrologic Model: Preliminary Results for Sidi Taibi Subbasin, Maamora, Morocco

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In order to demonstrate the impact of climatic change on the hydraulic heads and budget of groundwater in Morocco, the present study uses a numerical hydrologic model for Sidi Taibi unconfined aquifer located in western Maâmora, Gharb Basin. Precisely, this aquifer is located in the North of the capital of Morocco Rabat. It covers an area of approximately 400 Km^2 and it is the only one water supply for drinking water for almost 3 million inhabitants on the cities of the Western North of Morocco.

The code used is a CATchment Hydrologic Model named CATHY which allows the simulation of coupled three dimensional groundwater flow in porous media with variable saturation (FLOW3D) and water surface flow in the form of hillslopes, reserves, lakes and channels (SURF-ROUTE). A steady state simulation made it possible to find a hydraulic head distribution similar to the years eighties one when drought and pumping had less impact on the aquifer watertable. The use of this piezometric head as initial condition of a series of transient state simulation made it possible to predict the decrease in hydraulic head and groundwater reserves as a result of 4% decrease in rainfall predicted recent studies using climatic model MAGICC/SCENGEN and the scenario IS92a of emission provided by the IPCC as well as the state of hydraulic head spatial distribution of the year 2020.

Key words: Modelling, Climate Change, Groundwater