



Circulation of Surface Water And Groundwater. Geophysical approach (electrical tomography). Western Haouz plain. Western Morocco

Chouikri ibtissam (1), El Mandour Abdennabi (1), Jeffal Mohammed (2), Himi Mahjoub (3,4), Samia Rochdane (1), Morad Karroum (1), Mohammed Elgettafi (4), and Albert Casas (5)

(1) Caddi Ayyad, Faculty of sciences Semlalia, Geology, Marrakech, Morocco (ibtissam312@gmail.com), (2) Georesources laboratory , Department of Earth Sciences , Faculty of Science and Technology , BP 549, Marrakech, Morocco.(jaffal_m@yahoo.fr), (3) National School of Applied Scienes Al Hoceima. University Mohammed 1, Morocco, (4) Polydisciplinary Faculty Nadour . University Mohammed 1 Oujda, Morocco.(melgettafi@yahoo.fr), (5) Faculty of Geology, University of Barcelona, Marti & Franques, s/n. 08028 Barcelona, Espagne. (albert.casas@ub.edu)

The Western Haouz plain and the Mejjate plain constitute a vast alluvial plain of about 2800 km². The area is located between 30 and 80 km south-west of Marrakech city and it is characterized by a semi-arid climate. The morphology of the plain is known by a flat topography, monotone and it is drained by three wadis: Nfis wadi, Assif El Mal wadi and Chichaoua wadi.

The compilation of Geological, Geophysical and hydrogeological data shows that the Western Haouz plain is divided into two parts, it is a synclinal form separated by Marmouta horst and Guemassa horst. In the southern part, the Mejjate syncline is subsiding and shows a several formations from the shales of the Paleozoic to the alluvium of the quaternary. In the northern part, the syncline is less developed and it is formed by the conglomerates of the Mio-Pliocene and the alluvium of the Quaternary. The gravity map established shows positive anomalies due to the outcrop of the basement, and negative anomalies in the subsiding basins.

Hydrogeologically, the geometry of the reservoirs and the groundwater circulation are controlled by geology (Rifts, flexure, anticline and syncline). The southern part of the plain between the Marmouta anticline and the piedmont of the High Atlas Mountains shows two aquifers; the unconfined aquifer housed in thick formations of Quaternary and Mio-Pliocene; and the confined aquifer housed in dolomitic limestones of the Cenomanian-Turonian. The confined aquifer is fed at the northern flank of the High Atlas showing karts morphology and high cliff of limestone slab of the Turonian. The outlet of the deep confined aquifer is shown by Abainou source with a variation between 300 and 600 l/s south of the Marmouta anticline and constitutes a barrier for the deep waters flow circulations.