Contribution of Geophysics to Structural Recognition and Prospecting Groundwater in the Guelmim Plain, Bas Draa Basin, Morocco

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In the Guelmim plain (Bas Draa Basin, Morocco), several geophysical surveys has been undertaken. The results of the analysis and the synthesis of these studies led to some structural and hydrogeological conclusions. These conclusions allows to best orient the hydrogeological prospecting, and to a good management of the local water resources.

In the structural plan

The gravimetric prospecting allows highlighting some anomalies and lineaments which correspond to structural lineaments such in Taïdalt plain in the south eastern of the study area and in the Seyad-Noun plain, south-western of the Guelmim city. These regions showed a much more fracturation. The high resolution seismic shows that the deep structure of the Guelmim basin is a syncline with an axis oriented ENE-WSW, the thickness of the Cambrian formation is more than 1500m and the top of the Adoudounien limestone formation under Guelmim city is more than 2000m deep. Between Jbel Tayert and Jbel Taïssa, the limestone is much fractured and some thrust slices are seen towards the south.

The electrical prospecting allows to mapping the geometry of the resistant bed-rock attributed to the unfractured shales which constitute an impermeable floor.

In the hydrogeological plan

The electrical study shows that the plio-quaternary cover is very heterogeneous and well developed at the centre of the plain and at the western part of the study area, but this region is characterised by low resistivity indicating a bad water quality. The high resolution seismic shows that the limestone formation is very deep in the almost part of the Guelmim plain so that the hydrogeological prospecting must obviously be oriented near the limestone outcrops especially at Jbel Taïssa.

Key words: geophysical prospecting, hydrogeology, structural, Guelmim plain, Morocco.