

## Groundwater Potential in the Central Part of Al Jabal Al Akhdar Area, Ne Libya

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**Abstract :** Al Jabal Al Akhdar in the north-eastern part of Libya represents a region with promising ecological underpinning for grazing and other agricultural developments. The groundwater potential of both Upper Cretaceous and Eocene aquifers was studied based the available literature and a complete database for about 112 water wells drilled in the period 2003-2009. In this research, the hydrogeological methods will be integrated with the Geographic Information System (GIS) that played a main role in highlighting the spatial characteristics of the groundwater system. The results indicate that the depth to water for the Upper Cretaceous aquifer ranges from 150 to 458 m, and the piezometric surface decreases from over 500 m (m.s.l) in the northern parts to -20 m (m.s.l) in southeastern part. Salinity ranges between 303 and 1329 mg/l indicating that groundwater belongs to the slightly fresh water class. In the Eocene aquifer, the depth to groundwater ranges from 120 to 290.5 m and the potentiometric level decreases gradually southwards from 220 to -51 m (m.s.l) and characterized by steep slope in the southeastern part of the study area, where the aquifer characterized by relatively high productivity (specific capacity ranges between 10.08 and 332.3 m<sup>2</sup>/day). The groundwater salinity within this aquifer ranges between 198 and 2800 mg/l (fresh to brackish water class). The annual average rainfall (from 280 to 500 mm) plays a significant role in the recharge of the two aquifers. The priority of groundwater quality and potentiality increases towards the central and northern portions of the concerned area.

**Keywords :** Eocene and Upper Cretaceous aquifers, rainfall, potentiality, Geographic Information System (GIS)

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