

# **A Study on the Relation between Recent Induced Seismicity and Water Level in the Northwestern Part of Nasser Lake, Aswan, Egypt**

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## **Abstract**

The Nasser Lake is located in a region of very infrequent earthquake occurrence, as revealed by the 5000- year recorded history of Egypt. After seventeen years of filling of the Aswan High Dam Reservoir, a long sequence of induced earthquakes began. The main shock,  $M_s= 5.6$ , occurred on November 14, 1981, preceded by several foreshocks and followed by large number of aftershocks. After 33 years, the seismic activity persists, but it is substantially reduced in frequency and magnitude. The aim of this investigation is to studying the influence of the reservoir on induced seismicity and determination of focal mechanism of some earthquakes occurred in the northwestern part of the Aswan High Dam Reservoir. These investigations indicate that the seismic activity took place mainly along Kalabsha fault and small parallel segments; also, there is a clustering of activity at Khor El-Ramla area about 40 km southwest of the High Dam. In the period from 1982 to the end of 2014, seventy five earthquakes with magnitude  $3.5 < M < 4.0$  and thirteen earthquakes with magnitude greater than or equal to 4.0 were occurred. In addition, it is shows that these earthquakes occurred during both loading and unloading periods. This is indicating that the influence of the reservoir itself does not produce earthquakes, and there is no direct relation between the change of the daily rate and the size of earthquakes, so it cannot be used as a tool for prediction in case of Aswan Reservoir confirming that it is a unique reservoir in its behavior. Composite focal mechanism for four different seismic zones west of Nasser Lake show strike slip faults with minor normal component. The P (pressure) and T (tension) stress axes are trending ESE-WNW and NNE-SSW respectively.