



## Comparison of the Groundwater Quality in the West Tahta Area, Upper Egypt in 1989 and 2011

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### ABSTRACT

Egypt is characterized by arid climate with rare rainfall that means surface water. The River Nile is the main source of water supply. The study area is located in Upper Egypt in the western desert. The area under investigation is subjected to intensive development in the last twenty years, clearly seen in the change of the agriculture and urban areas. The rapid increase of the population in Egypt especially in the upper part leads to an increasing demand for houses on the old cultivated land lead to the migration towards the desert and reclaimed new areas. These new reclaimed areas are depending on the ground water. The extensive use of groundwater and increasing fertilizing system leads to the change of the water table, characterization and quality. In this study we use the analysis of 30 groundwater samples collected and analyzed in 1989 and 28 groundwater samples collected and analyzed in 2011 from the same area to identify the change in the quality of the ground water. According the hydrogeologic data which were collected from the study area in 1989 and 2011 we found a changing water table decreasing, from 1 to 48 m in 1989 and 5 to 60 m in 2011. The water level is decreasing in the same direction towards the River Nile. The sufficient recharge and leaching and dissolution of the aquifer materials due to extensive use lead to increase in TDS which reaching to 4453 ppm in 2011. The water type in the 1989 samples is mainly  $\text{NaHCO}_3$  and in 2011 samples  $\text{Na}_2\text{SO}_4$ . Grid classification shows that the water samples collected in 1989 are mainly sodium bicarbonate and sodium chloride extending to sodium sulphate while the water samples collected in 2011 are mainly sodium sulphate and sodium chloride. Most of the 1989 groundwater samples are suitable for drinking purposes while majority of the 2011 groundwater samples are not suitable due to high salinity.

### KEYWORDS

Under Groundwater; Withdrawal; West Tahta; Evaluation of Groundwater

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