

## Integrated Surface and Subsurface Studies for Water Resources Evaluation in Southeastern Part of Sinai, Egypt

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The integration between different studies contributing to the clear vision is important for planners and decision makers. The GIS technique is an effective tool that can analyze the multi-data from the different sources. This contribution aims to study the integration between surface and subsurface studies to evaluate water resources for enhancing the master plan of sustainable development of the study area.

Hydrological studies of drainage basins help in calculating the amounts of runoff, and the morphometric analysis of the drainage network leads to detecting the paths and direction of surface water. From the subsurface point of view, the geoelectric resistivity technique of geophysical investigation is applied for identifying the physical properties of the subsurface setting by extracting a set of maps for the aquifer properties. In addition, the geoelectric subsurface sections were used in creating a morphological map for the top surface of basement rock, therefore the water paths under the surface was delineated.

A set of maps was constructed based on the vertical and lateral cross sections that induced from analysis of aeromagnetic and resistivity data. In addition, to the structural features that affected the groundwater behavior.

Results indicated that the integration of these two types of applications give a real imagination about the subsurface behavior of groundwater through different kinds of surface and subsurface mapping. These maps display areas that are suitable for agriculture, touristic activities and urban expansion and can be used as input data for master plans of the area development strategies.