

Assessing aquifer interactions to support sustainable water resource management in Kuwait

The challenge...

Kuwait has limited water resources, and both the Kuwait Group and the Damman Formation aquifers in southern Kuwait have been intensively exploited for their brackish groundwater for several decades.

This exploitation has led to a substantial decline in the potentiometric heads of the aquifers (the level of surface to which water will rise in tightly cased wells), and has affected the inter-aquifer flow regime. This can have an adverse impact both on the availability and on the quality of the water exploited from the aquifers.

To support sustainable water management, Kuwait needed assistance in understanding the dynamics of water within the aquifers.

The project...

An IAEA technical cooperation project was established to assess the characteristics of the Kuwait Group and the Damman Formation aquifers. The project aimed to identify the hydrogeological and hydrochemical situation of both aquifers, and with this information, to support the development of exploitation plans for the aquifers that would contribute to ensuring the long term sustainability of these limited water resources.

Through the project, both aquifers were investigated and evaluated. The age of the groundwater in the two aquifers was defined, and the aquifer recharge sources were identified.

The IAEA trained scientific staff to carry out studies using isotopic hydrology to delineate flow regime in the aquifers. Four scientific visits, one fellowship training and six expert missions were conducted under the project, and necessary equipment was also procured.

The impact...

The project produced reliable and detailed information on aquifer characteristics, supporting a better understanding of the current situation of aquifers in southern Kuwait. With the data collected through the project, it was possible to formulate an appropriate management strategy for the management of the groundwater resources. In addition, a more detailed conceptual model of the groundwater flow and transport within the assessed aquifer systems was developed for further investigation.

In the long-run, the project findings and the capacities in isotope hydrology that have been created are expected to make an important contribution to the sustainable management of Kuwait's limited groundwater resources."



Training in isotopic sampling in the field.