



IAEA

International Atomic Energy Agency

Atoms for Peace

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Managing groundwater resources in Zambia

The challenge...

Water shortages, conflicting demands for water and environmental pollution from human activities threaten the availability and quality of groundwater in Lusaka, Zambia. The government is focusing on sustainable water resource development in order to facilitate equitable provision of water to all user groups and to ensure supply under varying conditions.

The project...

The IAEA worked with the staff of the Ministry of Energy and Water Development to identify potential pollution sources and to evaluate the extent of groundwater pollution. Capacities in isotope hydrology were built in the Zambian water sector. These capacities were used to characterize the aquifers, supporting better groundwater management and long term sustainable development.

Existing hydrological, geological and hydrogeological information was reviewed, and fieldwork, including sampling campaigns, was carried out. The resulting isotope and hydrochemical data were analysed and interpreted, and the project results were synthesized and evaluated. Analytical services were provided for isotope analyses, including those of stable water isotopes, tritium, and ^{13}C and ^{14}C .

Eight fellowships and one scientific visit helped to build national capacity in the area of groundwater hydrology. Sampling and analytical equipment and facilities were also provided, increasing Zambia's capacity to apply isotope hydrology techniques in support of sustainable groundwater management.

The impact...

The project results suggest that although the quality of groundwater in Lusaka is not critical, it is under threat, considering its hydrodynamics and the high rates of urban development and population growth.

Regarding the amount of water available, isotope data suggest that recharge rates have not changed significantly over the past 20 to 25 years, and that hydrodynamics do not seem to be affected by the increase in groundwater exploitation.

Considerable isotope data were gathered and further well-planned studies on groundwater resources are expected to help the Government move closer to its mission of ensuring safe drinking water for the Zambian population.

