

Tapping Into an Ancient Source

Isotope Hydrology Techniques to Help Manage Water Resources

Of all the water on Earth, less than 3% is fresh water. Life is impossible without a regular supply of freshwater. But, that freshwater supply is shrinking due to rising consumption rates driven by an ever-increasing population, fast-paced industrialization, pollution and climate change.

If we do not manage our freshwater resource more effectively, up to 7 billion people may be confronted with water scarcity by mid-century. The IAEA develops nuclear techniques that accurately assess water quality and quantity, measurements that are indispensable when managing meager water resources. But how nuclear science does fit into water resource management?

The Water Resources Program at the IAEA uses a powerful tool, isotope hydrology, that aids in coping with water scarcity. IAEA scientists are convinced that if we understand how to manage water efficiently, there will be sufficient renewable and non-renewable water sources for meet global needs.

Gathering at a briefing held during the IAEA's *54th General Conference* on 23 September, IAEA Deputy Director General Werner Burkart focused on the IAEA's role in sustainable water resources management. He emphasized that "Water is life. Access to fresh water is a human right, yet every year 2 million people die due to the lack of clean, drinking water."

The event also included senior officials concerned about the growing challenge of water resource management, including presentations from U.S. Ambassador Glyn Davis, Dr. Srikumar Banerjee, Chairman of Atomic Energy Commission of India, Fortunato de la Pena, Undersecretary of the Department of Science and Technology of the Philippines, and Willi Struckmeier, the President of the International Association of Hydrogeologists were speakers at the event.

Samples of water from the Nubian aquifer, which was captured in this underground reservoir over a million years ago, were offered for tasting. Pradeep Aggarwal, IAEA water expert, informed the gathering that the Nubian aquifer sample's age had been confirmed at one million years by using isotope hydrology techniques.

Isotope techniques can determine the origin, age and renewal rate of groundwater, and whether it is at risk of salt water intrusions or contamination. It also permits the rapid and reliable mapping of non-renewable groundwater resources, the majority of which are transboundary aquifers, such as the Nubian aquifer shared by Libya, Chad, Egypt, and Sudan. These maps are vital in ensuring the resources equitable use. The event, while highlighting the crucial role of IAEA in channelling nuclear technologies to manage water resources, also drew attention to the fact that there is need for a coordinated effort to find sustainable solutions to ensure the supply of freshwater.

-- *By Misha Kidambi, IAEA Division of Public Information*