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Enhancing Regional Capacities for the Isotope Based Assessment of Water Resources in the Context of Adapting to Climate Change

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A Technical Cooperation Example

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Main Areas of Work



Science and Technology



Safety and Security



Safeguards and Verification

The IAEA and Climate Change



Rafael Mariano Grossi
Director General IAEA

Coming to COP 25 just one week after taking office “reflects the importance of the issue and my firm belief that nuclear science and technology have an important role to play in helping the world to address the climate emergency”

TC programme topic areas

Water & Environment



Energy

Food & Agriculture



Radiation Technology



Safety



Health & Nutrition



Knowledge Management



Problem Statement for Project RER/7/013

- The better understanding of complex aquifer systems and groundwater-surface-water interactions is indispensable for effective integrated water management
- Isotope hydrology is an excellent tool for characterizing and understanding aquifer systems
- Proficiency in isotope-based techniques and capacity to apply them differs significantly among countries



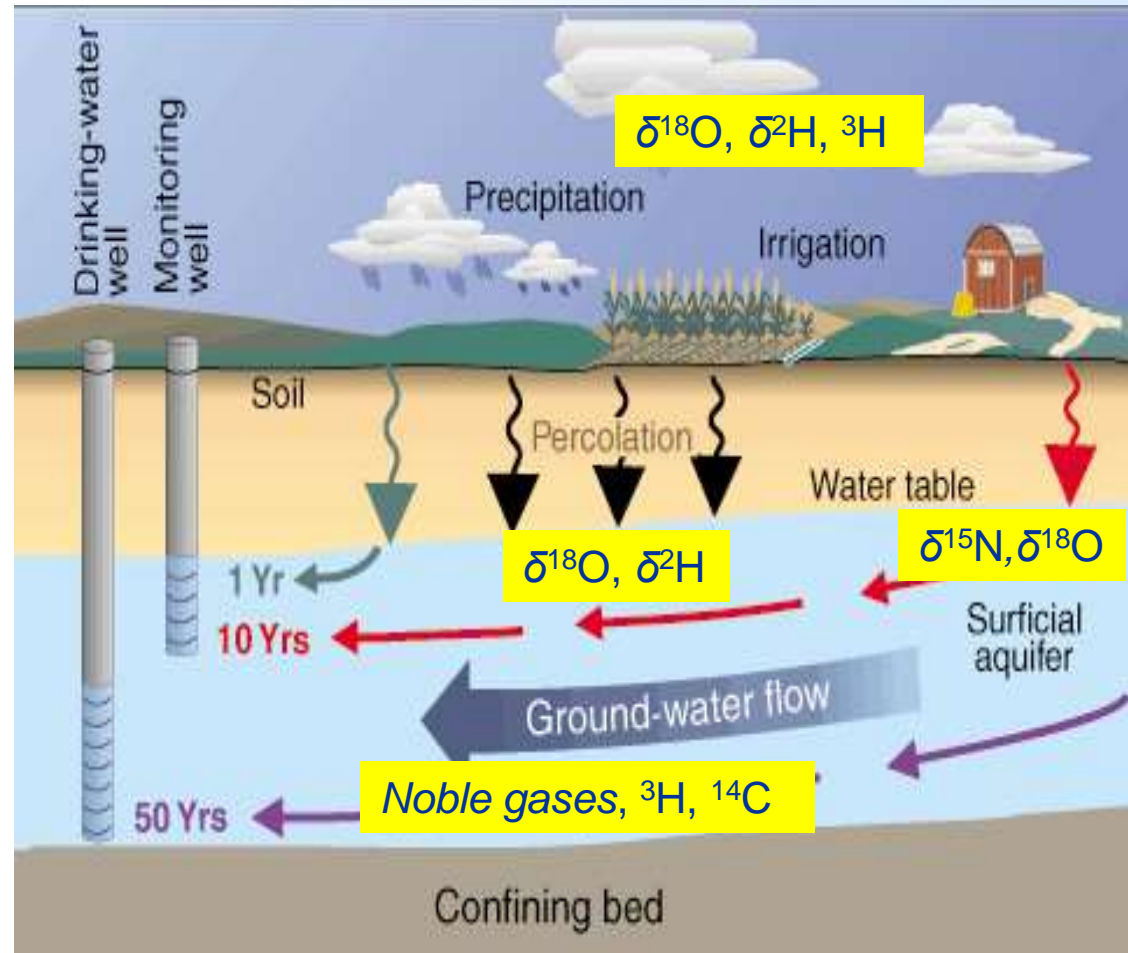
Why Isotope Hydrology

Isotopes are used as **powerful tracers** or **fingerprints** of:

- Source and movement of water
- Climatic conditions (climate change studies)
- Geochemical and hydrological processes
- Dynamics of hydrological processes (groundwater ages)

Isotope Hydrology

- allows for a **rapid understanding** of the hydrological system that may otherwise require years or decades of monitoring
- in some cases **provides a nearly unique tool** (e.g. age dating, recharge rates in arid areas)
- is **cost-effective**



Technical Cooperation Project RER/7/013

Title: Evaluating Groundwater Resources and Groundwater-Surface-Water Interactions in the Context of Adapting to Climate Change

Objective: To enhance evidence-based decision making in support of SDG target 6.5 “By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate”.

Project Duration: 2020-2023

Project Counterparts: 27 Countries from 38 institutions

Project Budget:

Funded:	866,580
Not funded:	793,500
Total:	1,660,080



Planned Outcomes

 **Increased awareness** on the existence of isotope techniques

 **Transferred knowledge and build capacity** on the use of isotope hydrology techniques

 Specific **sub-regional and transboundary questions** answered

 **Regional monitoring network** enhanced and sustained

 Project results **lead to policies and follow-up actions**

13 CLIMATE ACTION



6 CLEAN WATER AND SANITATION



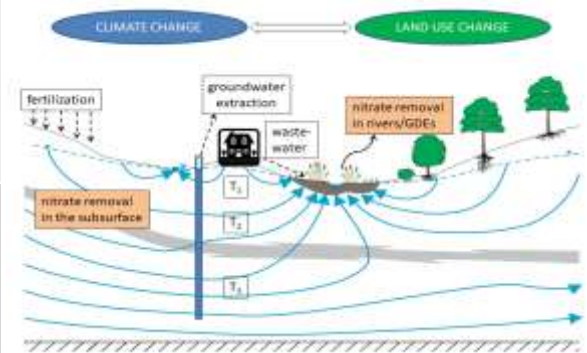
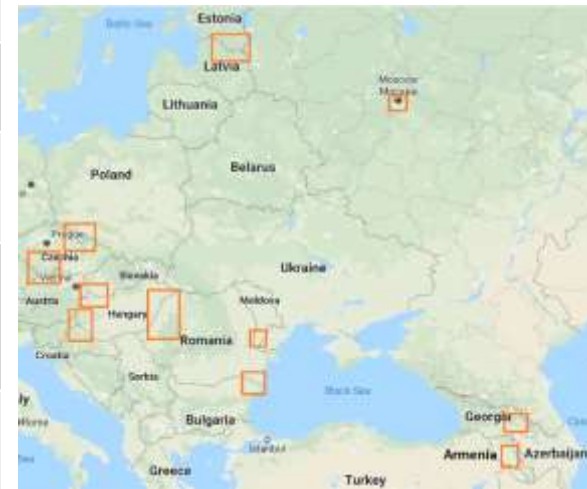
17 PARTNERSHIPS FOR THE GOALS



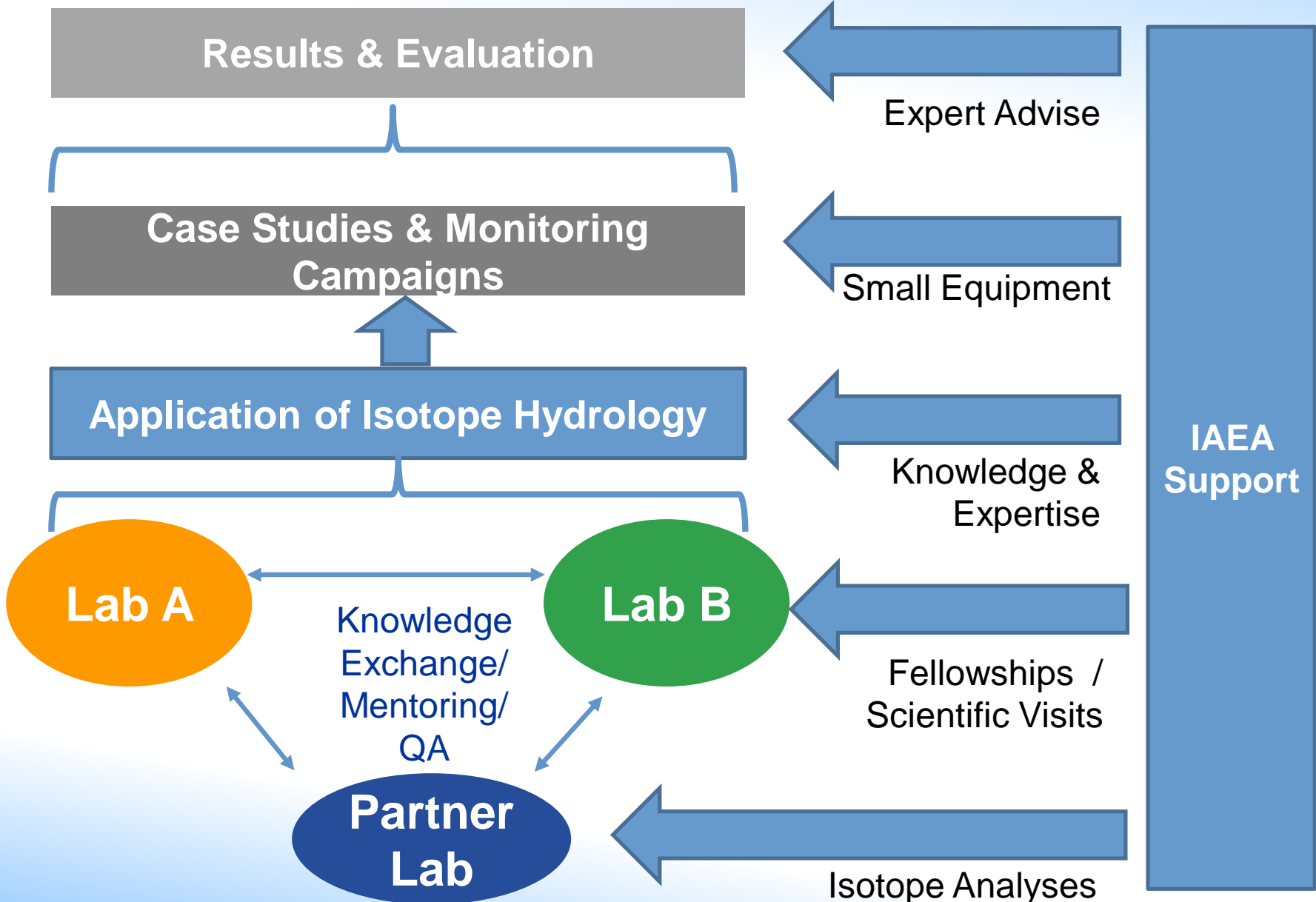
Project Case Studies



Case-study	Participating Countries
Application of isotope hydrology techniques in the Oko transboundary karst aquifer shared by Bosnia and Herzegovina-Montenegro	Bosnia and Herzegovina, Montenegro
Coastal Aquifers	Montenegro, Cyprus, Portugal, Turkey, Bulgaria
Application of isotope hydrology in the transboundary Syr Darya river basin	Kazakhstan, Tajikistan
Source, age and recharge patterns of groundwaters in Southeast Europe (SARGE)	Bulgaria, Ukraine, Romania, Moldova
Influence of climate change on groundwater resources and groundwater-surface water interaction in the Sava River basin	Slovenia, Croatia, Bosnia and Herzegovina, Serbia
Vulnerability assessment of stratified, often transboundary aquifers using the isotope (dating) methods	Armenia, Bulgaria, Croatia, Czechia, Estonia, Georgia, Hungary, Latvia, Moldova, Romania, Russia, Slovakia, Slovenia
Environmental tracers for the assessment of nitrate contamination of coupled groundwater - surface water systems	Czech Republic, Georgia, Poland, Russian Federation, Ukraine



Case Study Implementation Strategy and IAEA Support





Technical Cooperation Programme

*Technical cooperation:
delivering results for peace
and development*



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RER7013 Team



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