



Groundwater for aDvancing Resilience (G4DR) in Africa

Key facts


- **Project duration:**
4 years
(September 1, 2024 - July 31, 2028)
- **Implementation scales:**
Multi-level (local, national, transboundary, Pan-African)
- **Core partners:**
Food and Agriculture Organization of the United Nations (FAO), International Water Management Institute (IWMI), African Ministers' Council on Water (AMCOW), International Institute for Applied Systems Analysis (IIASA), Southern African Development Community – Groundwater Management Institute (SADC-GMI), and project countries (Benin, Malawi, Mozambique, Togo and Uganda)
- **Pilot sites:**
Shire Aquifer (Malawi and Mozambique), Upper Nile Water Management Zone (Uganda), Mono River Basin (Benin and Togo)

The Groundwater for aDvancing Resilience (G4DR) project aims to enhance water security and resilience by unlocking the potential of sustainable groundwater development and protection. Groundwater resources in Africa are not fully tapped despite their critical role in providing safe water, improving food security and supporting climate resilience.

Significance of groundwater

 **Africa's largest water resource** but **underutilized** in planning and management

 **8 of 10** rural residents depend on **groundwater** for safe water and sanitation

 **400 million** people **lack access** to basic drinking water

 Only **3%** of cultivated land is formally irrigated. Groundwater can be important for **smallholder farmers** when the rains fail to come.



Project team visit to a borehole in the transboundary Shire Alluvial Aquifer (photo: Omar Sirage Coiara).

Partners

The G4DR project, funded by the Global Environment Facility (GEF), is implemented by the Food and Agriculture Organization of the United Nations (FAO) and executed by the International Water Management Institute (IWMI) in partnership with the African Ministers' Council on Water (AMCOW), International Institute for Applied Systems Analysis (IIASA), Southern African Development Community – Groundwater Management Institute (SADC-GMI) and national ministries responsible for water - Ministry of Water and Mines (Benin), Ministry of Water and Sanitation (Malawi), Ministry of Public Works, Housing and Water Resources (Mozambique), Ministry of Water and Village Hydraulics (Togo), and the Ministry of Water and Environment (Uganda). The project also works closely with the Mono Basin Authority (MBA).

Objectives

To enhance water security and resilience in Africa by unlocking the potential of sustainable groundwater development and management. This objective is achieved through activities in five components:

- **Strategic groundwater planning:** Supporting the Pan-African Groundwater Program (APAGroP).
- **Evidence and capacity development:** Identifying aquifers that present risks and opportunities for water security and resilience.
- **Demonstrating benefits:** Conducting pilot projects to showcase the role of groundwater in climate resilience, agriculture and transboundary cooperation.
- **Long-term vision and youth engagement:** Establishing a youth forum for groundwater governance.
- **Knowledge management and monitoring and evaluation:** Ensuring adaptive learning and effective project monitoring.

Components

Strategic groundwater planning (led by AMCOW)

- Enhancing the focus on groundwater in regional monitoring frameworks.
- Integrating groundwater into regional strategies and plans.

Evidence and capacity development (led by IIASA)

- Assessing risks and opportunities for groundwater use.
- Utilizing data from hydrological models, Earth Observation and in-situ monitoring.

Demonstrating benefits (led by IWMI)

- Implementing pilot projects in three key groundwater-dependent sites (Shire Aquifer [Malawi and Mozambique], Upper Nile Water Management Zone [Uganda], Mono River Basin [Benin and Togo]).

- Activities include groundwater monitoring, well rehabilitation and gender assessments.
- SADC-GMI will coordinate knowledge exchange across the three pilot sites with the aim of enhancing decision-making on groundwater investments.

Long-term vision and youth engagement (led by IWMI)

- Creating a Youth Forum for the G4DR project to engage with young professionals.
- Enhancing youth participation in groundwater governance.

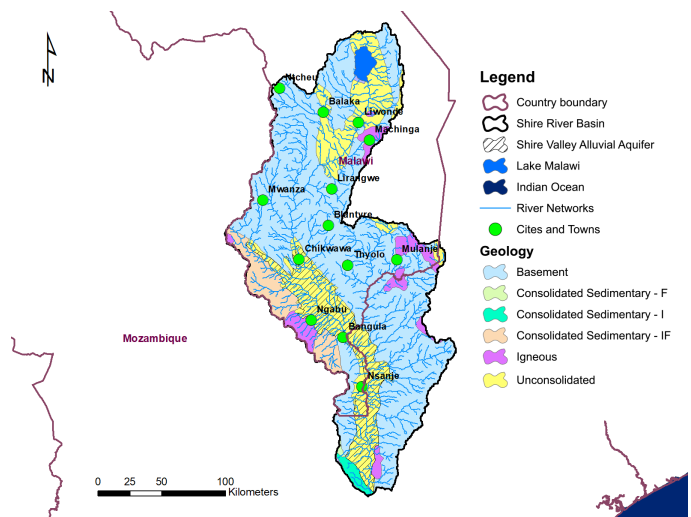
Knowledge management and monitoring and evaluation (led by IWMI)

- Developing communication tools for project dissemination.
- Implementing adaptive results-based management.

Pilot sites

Safeguarding the Shire Aquifer System (Malawi and Mozambique)

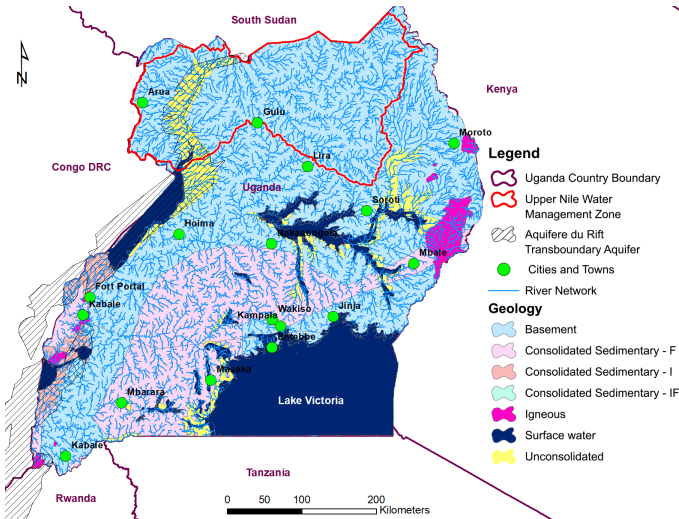
In the face of increasing climate variability, communities in Malawi and Mozambique rely heavily on groundwater from the Shire Aquifer. However, water quality challenges such as high fluoride and nitrate levels along with the increasing risks from floods and droughts threaten this critical resource. Through transboundary cooperation, this pilot project aims to enhance groundwater monitoring and data sharing while strengthening governance at the basin level. By improving regional coordination, this project aims to ensure more sustainable groundwater management, protecting livelihoods and ecosystems across national borders.



Integrating groundwater into water planning in the Upper Nile Water Management Zone (Uganda)

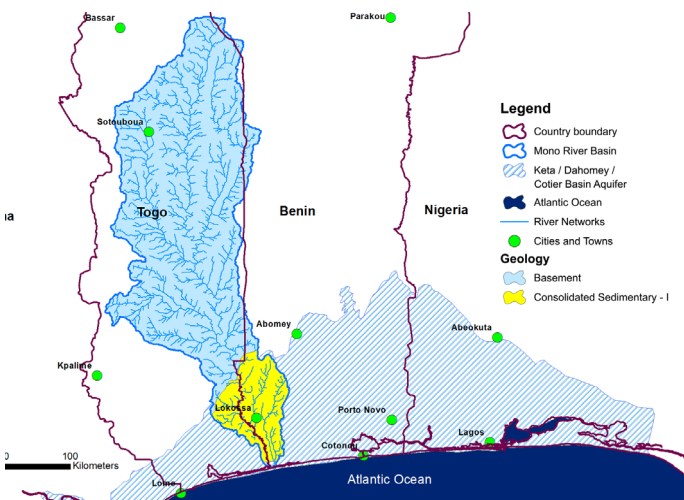
Uganda's Upper Nile Water Management Zone is experiencing increasing pressure on its water resources due to rapid urbanization, agricultural expansion and climate change.

Despite its importance, groundwater has not been fully integrated into national water planning. This project aims to change that by establishing robust groundwater monitoring systems, enhancing recharge management and incorporating groundwater into catchment planning. By improving data collection and management, Uganda is laying the foundation for more resilient and sustainable water supply systems that can support both rural and urban communities.



Transboundary groundwater cooperation in the Mono River Basin (Benin and Togo)

The Mono River Basin, shared by Benin and Togo, faces mounting threats from pollution, saltwater intrusion and weak cross-border coordination. Groundwater plays a vital role in supporting local water supplies, yet management of this resource has been fragmented. This project aims to change that by developing a harmonized groundwater monitoring network, strengthening data collection efforts, and ensuring groundwater is considered in broader basin planning. By fostering collaboration between the two nations, the project aims to create a model for effective transboundary groundwater governance, securing water access for future generations.



Expected outcomes



Stronger governance and planning

- A continental framework for coordinated groundwater management is established.
- The role of groundwater is institutionalized and integrated into wider water policies and investments.



Better decision-making through data

- Enhanced groundwater data and evidence inform planning and risk management.
- Basin-level groundwater integration and data platforms are set up in three case study sites: Upper Nile Water Management Zone (Uganda), Shire Aquifer (Malawi and Mozambique), and Mono River Basin (Togo and Benin).



Water security and environmental gains

- An area of 26,000+ hectares under improved groundwater management, supporting enhanced agricultural production, drinking water provision and ecosystem sustainability.
- Broader impacts such as poverty reduction, conflict prevention and climate resilience.



Capacity development and knowledge exchange

- Approximately 34,000+ people benefit from capacity development.
- A community of practice supports cross-border knowledge exchange.



Gender equality and social inclusion

- Youth engagement through forums and ambassador initiatives.
- Gender equality and social inclusion mainstreamed into groundwater planning and decision-making in project activities.



Transboundary cooperation and outreach

- Lessons are shared through effective strategies, using digital tools and social media.
- Best practices are promoted via conferences and stakeholder dialogues.

References

WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). 2021. *Progress on household drinking water, sanitation and hygiene 2000-2020: Five years into the SDGs*. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). Available at <https://washdata.org/sites/default/files/2021-07/jmp-2021-wash-households.pdf> (accessed on May 26, 2025).

Contacts

Dr Jonathan Lautze, Chief Technical Advisor, G4DR Project (j.lautze@cgiar.org)

Cebolenkosi Zuma, Coordinator, G4DR Project (c.zuma@cgiar.org)



Citation

International Water Management Institute (IWMI). 2025. *Groundwater for aDvancing Resilience (G4DR) in Africa*. Colombo, Sri Lanka: International Water Management Institute (IWMI). 4p.

Copyright © 2025, by IWMI. All rights reserved. IWMI encourages the use of its material provided that the organization is acknowledged and kept informed in all such instances.

Disclaimer: The boundaries and names shown and the designations used on maps do not imply official endorsement or acceptance by IWMI, CGIAR, our partner institutions, or donors.

Please send inquiries and comments to IWMI-Publications@cgiar.org

For access to all IWMI publications, visit www.iwmi.org/publications

IWMI
International Water
Management Institute



The International Water Management Institute (IWMI) is an international, research-for-development organization that works with governments, civil society and the private sector to solve water problems in developing countries and scale up solutions. Through partnership, IWMI combines research on the sustainable use of water and land resources, knowledge services and products with capacity strengthening, dialogue and policy analysis to support implementation of water management solutions for agriculture, ecosystems, climate change and inclusive economic growth. Headquartered in Colombo, Sri Lanka, IWMI is a CGIAR Research Center with offices in 15 countries and a global network of scientists operating in more than 55 countries.

**International Water
Management Institute (IWMI)**

Headquarters

127 Sunil Mawatha, Pelawatte,
Battaramulla, Sri Lanka

Mailing address:

P. O. Box 2075, Colombo, Sri Lanka

Tel: +94 11 2880000

Fax: +94 11 2786854

Email: iwmi@cgiar.org

www.iwmi.org