

COOPERATION IN INTERNATIONAL WATERS IN AFRICA

ANNUAL REPORT 2022

COVER PHOTO:

A woman walks during a sandstorm in Sudan.

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CREDIT LIST

This report was prepared by members of the CIWA team led by Ai-Ju Huang and Anders Jagerskog: Edoardo Borgomeo, Carine Durand, Charles Gilman, Anna Kim, Karen Schneider, and Svetlana Valieva. Contributions also were made by the following Bank staff and consultants: Richard Abdulnour, Francois Bertone, Anna Cestari, Thierry Davy, Nathan Engle, Ellen Hagerman, Shyam KC, Victor Osei Kwadwo, Kimberly Lyon, Palesa Mokorosi, Angelica V. Ospina, Sanjay Pahuja, Chantal Richey, Nicolas Salazar-Godoy, Simon Sottsas, Yeli Mariam Sou, Yukio Tanaka, Noosha Tayebi, Piet Theron, Jorge Trevino, Victor Vazquez, Malala Wakunguma, and Melissa Williams. Document design was created by Blossom.

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Abbreviations

AFD	Agence Française de Développement
ANBO	African Network of Basin Organizations
CBA	Community-Based Association
CIWA	Cooperation in International Waters in Africa
COM	Council of Ministers
COVID-19	Coronavirus Disease 2019
CMU	Country Management Unit
CSO	Civil Society Organization
CUVECOM	Cuvelia River Commission
DAS	Data Analytics Services
DRC	Democratic Republic of the Congo
ECMWF	European Center for Medium-range Weather Forecasting
ECPG	Eastern Cape Provincial Government
ELRP	Emergency Locust Response Program
ENTRO	Eastern Nile Technical Regional Office
ESIA	Environmental and Social Impact Assessment
FAO	Food and Agriculture Organization
FCV	Fragility, conflict, and violence
FY	Fiscal Year
GDE	Groundwater-dependent ecosystem
GEF	Global Environment Facility
GEMS	Geo-enabling Initiative for Monitoring and Supervision
GESI	Gender Equality and Social Inclusion
GIZ	German Agency for International Cooperation
GFDRR	Global Facility for Disaster Reduction and Recovery
GW4R	Groundwater for Resilience
HoA	Horn of Africa
HoA-GWI	Horn of Africa Groundwater Initiative
ICPAC	IGAD Climate Prediction and Application Center
IDA	International Development Association
IFAD	International Fund for Agriculture Development
IGAD	Intergovernmental Authority on Development
IPF	Investment Project Financing
LADP	Local Area Development Program
LCBC	Lake Chad Basin Commission
LIMCOM	Limpopo Watercourse Commission
LVBC	Lake Victoria Basin Commission
MoEWR	Ministry of Energy and Water Resources
MTR	Mid-Term Review

NBD	Nile Basin Discourse
NBI	Nile Basin Initiative
NBSP	Nile Basin Support Program
Nile-Sec	Nile Basin Initiative Secretariat
NCCR	Nile Cooperation for Climate Resilience
NCORE	Nile Cooperation for Results
NDF	National Discourse Forum
NEL	Nile Equatorial Lakes
NELIP	Nile Equatorial Lakes Investment Program
NELSAP-CU	Nile Equatorial Lakes Subsidiary Action Program Coordination Unit
NFG	National Focal Group
NIP	Nile Investment Program
NRBMP	Niger River Basin Management Project
NWRS	National Water Resources Strategy
OKACOM	Permanent Okavango River Basin Water Commission
ORASECOM	Orange-Senqu Commission
PPP	Public-Private Partnership
RBO	River basin organization
RS	Remotely-sensed data
RVAA	Regional Vulnerability Assessment and Analysis program
SADC	Southern African Development Community
SADC-GIP	SADC Groundwater Information Portal
SADC-GMI	SADC Groundwater Management Institute
SADRI	Southern Africa Drought Resilience Initiative
SAP	Strategic action program
SIIP	Sahel Irrigation Initiative Support
SIWI	Stockholm International Water Initiative
SMAB	Senegalo-Mauritanian Aquifer Basin
TAC	Technical Advisory Committee
TBA	Transboundary aquifer
TDA	Transboundary Diagnostic Analysis
WA+	Water Accounting+
WEFE	Water-energy-food-environment
WICA	Water Information and Communications in Africa
WQTWG	Water Quality Technical Working Group
WRM	Water resources management
WSA	Water Security Assessment
ZAMCOM	Zambezi Watercourse Commission
ZRA	Zambezi River Authority

Foreword



Ai-Ju Huang

The shocks keep coming—and persisting—in sub-Saharan Africa.

In the last year, the relentless impacts of the COVID-19 pandemic, increasing conflict and fragility, and climate change have dealt an economic blow to the continent. Extreme poverty is rising, economic growth is slowing, and financial risks from high debt levels are jeopardizing human capital and development gains.



Anders Jagerskog

Africa is warming at a faster rate than the global average and can expect more intense, variable, and frequent heat waves, droughts, floods, and cyclones, which are fueling fragility, food and water insecurity, loss of income, inequality, conflict, and displacement. In the last 20 years, the frequency of droughts has tripled in Africa. The worst drought in at least 40 years is devastating the Horn of Africa (HoA), killing livestock and crops, driving up poverty and child malnutrition, and forcing one million people from their homes to search for food and water. As a result, over 18 million people in Ethiopia, Kenya, and Somalia are facing acute food insecurity. The Sahel, too, faces severe water scarcity. Sudan is experiencing torrential rains while still recovering from devastating floods in 2020. The economic impacts from weather and climate disasters are profound—the 2021 floods in South Sudan alone caused damage totaling over \$US670 million. Water resources are not only critical for sustainable development but also for disease control in Africa, where 300 million people lack access to potable water and 700 million do not have adequate sanitation, hobbling efforts to mitigate the effect and contain the spread of infectious diseases, such as COVID-19.

In the 2022 fiscal year (FY22), the Cooperation in International

Waters in Africa (CIWA) worked to mitigate the continent's immense needs. These formidable challenges only strengthen our resolve to help countries collaborate over transboundary waters to share costs and benefits of building resilience, to address drivers of fragility, conflict, and violence (FCV), and to foster green, resilient, and inclusive development (GRID) and recovery from the pandemic.

Given the increasing scarcity of surface water, CIWA redoubled its focus on increasing the sustainable use and management of water beneath the earth's surface. In Botswana and Zimbabwe, we are enhancing groundwater development by supporting the rehabilitation of small-scale infrastructure. In the Sahel region, we are removing constraints on farmer-led irrigation by using groundwater and exploring how best to support cooperative management of the Senegalo-Mauritanian Aquifer Basin (SMAB). CIWA-supported activities in West Africa are leveraging very significant IDA financing, for 3 national and 2 regional projects focused on water resources management and transboundary cooperation. In the Horn of Africa, we are contributing our transboundary waters expertise to the World Bank's US\$385 million project, Horn of Africa—Groundwater for Resilience. We are also building capacity and strengthening institutions to improve groundwater management in Southern Africa through CIWA's technical assistance to the Southern Africa Development Community Groundwater Management Institute (SADC GMI).

Helping our partner countries prepare for, and mitigate, climate change is a crucial way to build resilience. We do that through projects such as the Nile Cooperation for Climate

Resilience (NCCR), which promotes collaboration on water resources management and development, builds capacity on dam safety, and improves water quality planning, and through technical assistance such as the Southern Africa Drought Resilience Initiative (SADRI), which addresses cross-border drought risks, improves cooperation, and creates a holistic vision of drought-risk management. We also championed the importance of climate resilience in African transboundary waters at COP26, the United Nations (UN) Climate Change Conference in Scotland, and at the World Water Forum in Senegal.

We are strengthening the link between transboundary water management and freshwater biodiversity conservation by supporting activities to prevent further biodiversity loss, which is key to sustaining livelihoods, spurring sustainable economic development, and mitigating climate change impacts.

Gender inequality in Africa remains high, and progress toward gender equity has stagnated. CIWA is stepping up its work on gender equality and social inclusion (GESI) by conducting trainings, producing learning notes, and launching a Male Champions Initiative developed with the Stockholm International Water Initiative (SIWI) to encourage men to create a favorable enabling environment for women to become leaders in transboundary organizations.

Because countries cannot manage what they cannot measure, CIWA is continuing its support for the Bank-executed technical assistance, Water Data Revolution: Closing the Data Gap for Transboundary Water in Africa, by assessing organizations' data weaknesses that could be mitigated by using satellite-based, remotely sensed (RS) data.

To elevate the importance of transboundary cooperation, we are ramping up our external communications, especially on social media, where we launched CIWA's Twitter account and developed digital campaigns to highlight our work and that of our partners.

We closed two successful grants in the Nile Basin, Engaging Civil Society for Social and Climate Resilience in the Nile Basin and the Nile Basin Support Program, and three in the HoA including Support to Transboundary Water Resources Management (Somalia), Strengthening Resilience in the Horn of Africa, and the Horn of Africa Groundwater Initiative. All three activities informed the new US\$5 million CIWA grant, Untapping Resilience: Groundwater Management and Learning in the Horn of Africa's Borderlands and a new US\$385 million International Development Association (IDA)-funded World Bank project, Groundwater for Resilience. Both are part of a regional effort to increase sustainable access to, and management of, groundwater in the region's borderlands.

This last fiscal year was also a time of change and stocktaking for CIWA itself. We are grateful for the excellent leadership of Erwin De Nys, our former program manager who has taken a new role at the World Bank. Anders Jagerskog, senior water resources management specialist and the Bank's transboundary water focal point, is excited to step into this leadership position to oversee the team's impactful work.

As we celebrated 10 years of improved cooperation, management, and development of transboundary waters, we commissioned an external mid-term evaluation of the CIWA program. The final elements

of this evaluation are being incorporated into a report, which we look forward to considering in depth with our donors and other stakeholders in the next fiscal year.

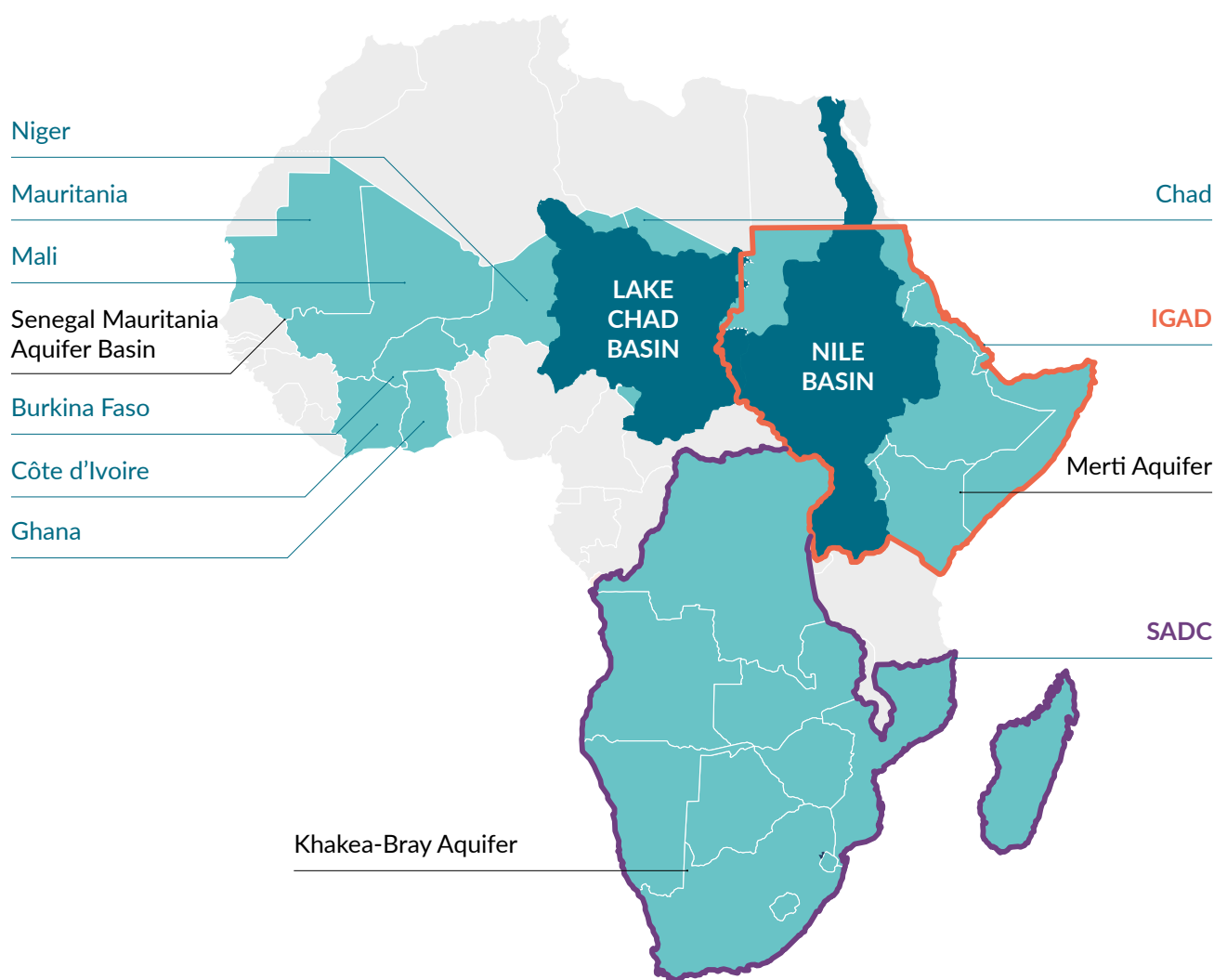
We are grateful for the ongoing support of our donors and for the resolve and dedication of our country partners, without whom Africa's future would be a little less bright.

Ai-Ju Huang

Anders Jagerskog

Program Managers

CIWA IN FY2022: A SNAPSHOT



Sustained support:
Nile River Basin, Lake Chad Basin

Strategic support:
SADC, IGAD, Senegal and South Sudan, Burkina Faso, Chad, Mali, Mauritania, Niger, Ghana and Côte d'Ivoire

— IGAD

— SADC

CIWA'S IMPACT

People who benefit from investments influenced by CIWA

53.89 million people

(from both mobilized and potential investments)



Investments

To manage watersheds, develop groundwater, build storage, etc.

US\$18.05 billion



Potential

US\$11.7 billion



Mobilized

US\$6.34 billion

Institutions

To build trust, coordinate planning, and manage shared resources

Transboundary institutions supported with CIWA technical assistance and financing



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Information

For understanding risks, better decision-making, and monitoring compliance

Strategic analyses and knowledge products used to illustrate the evidence base for cooperation



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Introduction

With 90 percent of Africa's water falling within transboundary river basin catchments, water resources management and development must be a collaborative endeavor. The heart of CIWA's work is convening countries with the goal of cooperating more effectively and with less friction on projects and infrastructure whose impact crosses borders. CIWA strives to foster cooperation, protect biodiversity, help countries beset by conflict and fragility, and spur climate resilience. It achieves this by advancing technical assistance and projects framed around its three pillars: *information—to understand risks, make better decisions, and monitor compliance; institutions—to build trust, coordinate planning, and manage shared resources; and investments—to manage watersheds, develop groundwater, and build storage. CIWA's grants support:*

- 1) **Sustained engagements with priority basins.** CIWA strengthens foundational elements such as data, legal agreements, institutions, and investment and operational plans.
- 2) **Strategic engagements,** which contribute to high-impact projects through analytical efforts, capacity building, and technical assistance.
- 3) **Knowledge generation and management initiatives,** which strengthen the evidence base to create tools and resources to manage international waters.

CIWA provides a platform to support national governments, regional organizations, and civil society to ensure that stakeholders' concerns are addressed and benefits are equitably distributed.

This report is organized as follows: the introduction gives a whole-of-program description of CIWA's work across core strategic directions: fragility, conflict, and violence (FCV); biodiversity; and resilience. These describe how CIWA is contributing

to positive change across multiple, intersecting domains and through its various support mechanisms. This is followed by regional sections that provide deeper dives into each of CIWA's grants. Results are focused on outputs from FY22, with previous years' accomplishments described for context as needed. Whole-of-project narratives and results are provided when a project closed in FY22. Following the regional narratives, this report presents CIWA's progress on cross-cutting themes including Water Data Revolution, GESI, and communications and a summary of CIWA's recently completed external mid-term evaluation. In Looking Ahead, we describe the current trajectories in CIWA's portfolio and how we expect them to be carried forward in the next fiscal year. Annexes provide: (i) analyses of CIWA's cumulative allocations, (ii) annual and cumulative results of CIWA's indicators, (iii) a risk analysis with an emphasis on recent shifts or mitigation opportunities, (iv) CIWA's cumulative detailed financial record, and (v) a value-for-money analysis of the cumulative portfolio.

Fragility, conflict, and violence

CIWA deepened its support to countries affected by FCV, increasing its footprint from 11 countries in FY21 to 17 in FY22—nearly all the 20 African countries classified as FCV. CIWA remains engaged in three priority FCV-affected regions—the HoA, the Sahel, and the Great Lakes. This included monitoring FCV-related events with an impact on transboundary water cooperation, strengthening resilience to climate change, improving water security, and making groundwater more accessible.

In the Horn of Africa (HoA), bank-executed support led to CIWA's new assistance, Untapping Resilience: Groundwater Management and Learning in the HoA's Borderlands,

and the complementary World Bank Groundwater for Resilience (GW4R) project, which are strengthening the ability of the Intergovernmental Authority on Development (IGAD) and communities to cope with, and adapt to, climate shocks. They are achieving this through enhanced management and use of transboundary groundwater resources and knowledge-generation efforts about water cooperation. The Sahel Groundwater Initiative is similarly contributing to unlocking groundwater use in the West Africa borderlands affected by FCV. In South Sudan, Sudan, and Ethiopia, the Nile Cooperation for Climate Resilience (NCCR) project is supporting drought and flood forecasting to mitigate climate risks in fragile environments.

In Western Africa, where Sahelian countries are facing unprecedented FCV challenges, CIWA is shifting from its traditional focus on integrated water resource management (WRM) to a more comprehensive regional water security framework. This approach responds to local challenges stemming from social exclusion, marginalization of women and girls, energy and food insecurity, forced displacement, conflict, and climate change. For example, the Improving Water Resource Management in West and Central Sahel technical assistance has a strong focus on supporting decentralized, smaller, and community-managed water infrastructure.

Aligned with the World Bank's FCV strategy, which has a new focus on remaining engaged during conflict situations, such decentralized investments are key for clients to deliver services in FCV zones, including during conflict. The Improving Water Resource Management in West and Central Sahel activity included a mapping of civil society organizations (CSOs) in Western Africa, with the objective of expanding the number of CIWA partners in remote FCV-affected areas and enhancing channels of communications with

communities. The involvement of women in transboundary WRM who are affected by FCV is critical, and CIWA is supporting analytics and research to learn about gender differences that can be targeted to lessen gender inequalities.

In Southern Africa, CIWA supported the rehabilitation of small-scale water infrastructure in Zimbabwe and Botswana to make groundwater more accessible. CIWA also improved information-sharing mechanisms that have enhanced water cooperation among Southern Africa Development Community (SADC) countries. Activities by the Southern Africa Drought Resilience Initiative (SADRI) focusing on energy, livelihoods, and food security have enhanced mitigation measures against droughts while reducing the impact of drivers of fragility and conflict among communities.

With the goal of deepening understanding of fragility and water cooperation at the local level, CIWA collaborated with the Stockholm International Peace Research Institute (SIPRI) to conduct a study on FCV and water cooperation. The SIPRI study draws on three case studies of transboundary basins in cross-border, FCV-affected regions in the HoA (Sio–Malaba–Malakishi Basin, the Dawa River and Aquifer, and the Bahr el Ghazal Basin and the Baggara Basin Aquifer) and provides lessons learned from cooperative initiatives in fragile contexts.¹

CIWA also produced biweekly FCV newsletters covering key news and launched knowledge products on international waters in three African sub-regions.

Biodiversity

Supporting a range of biodiversity-related activities in Sub-Saharan

Africa, CIWA conducted an assessment to better understand the linkages between program activities and biodiversity conservation. The assessment included (i) identifying key benefits of water, rivers, and other freshwater ecosystems in supporting biodiversity and the services and benefits associated with healthy, functional natural systems; (ii) identifying key potential threats to freshwater ecosystems; and (iii) developing a methodology and approach for assessing the contribution of future program activities on biodiversity conservation.

The assessment concluded that CIWA's support of biodiversity-related activities provides both direct and indirect benefits to biodiversity conservation efforts.

Key direct benefits include facilitating integrated, innovative approaches to better understand the linkages between improved ecosystem integrity and river connectivity, the role of climate change adaptation in freshwater resource planning and management, and the provision of ecosystem services. The assessment also highlighted the opportunity to develop a more structured, integrated approach to embedding biodiversity conservation considerations into the design and implementation of activities and initiatives. CIWA developed a draft conceptual framework for action on transboundary waters and biodiversity conservation.

Specific project interventions that support direct benefits include the development of a Multi-Sector Investment Opportunities Analysis, which is part of a strategy by Okavango River Commission (OKACOM), and the advanced model² for Inner Niger Delta ecosystem services. Other key interventions include the implementation of best practice feasibility studies and

Environmental and Social Impact Assessments (ESIAs); development of integrated watershed management strategies and plans; support for improved water quality in lakes, river systems, and river-bank restoration projects; and analytical work to facilitate improved understanding of groundwater-dependent ecosystems (GDEs). Key indirect benefits include strengthening river basin organizations (RBOs) and national water management agencies, supporting CSOs to enhance informed decision-making, developing platforms to share information, and supporting improved rural livelihoods to reduce dependency on unsustainable natural resource exploitation practices.

CIWA identified four potential opportunities for enhanced transboundary waters and biodiversity conservation work. They include (i) improvement of the overall environmental, human, and economic health of Lake Victoria and its surrounding communities through a holistic, cost-effective, long-term basin-wide sanitation approach; (ii) increased flood resilience in selected areas of South Sudan and Sudan with a potential focus on nature-based solutions to mitigate flood risk; (iii) resilient investments for pro-poor livelihoods aimed at increasing benefits to men and women that consider gender differences in economic opportunities and access to, and control over, land, biodiversity resources, and other productive assets; decision-making power; and vulnerability to biodiversity loss, climate change, and natural disasters in the Cubango-Okavango River Basin; and (iv) determination of potential options for a sustainable institutional mechanism to support cooperative transboundary management of SMAB.

CIWA also identified four potential thematic focus areas. These include (i) integration of freshwater

1 https://www.ciwaprogram.org/wp-content/uploads/Water_Cooperation_In_Hoa_CIWA_SIPRI.pdf

2 <https://www.ciwaprogram.org/blog/enhancing-niger-basins-ecosystem-through-modeling-and-improved-decision-making/>

biodiversity into the development planning cycle; (ii) investments in nature-based solutions as a cost-effective approach to WRM, disaster risk reduction, and climate change mitigation; (iii) protection and sustainable management of water towers as important areas that produce relatively large volumes of runoff to sustain downstream lowland areas; and (iv) TFCA as large conservation and development landscapes that are important for integrated WRM, climate resilience, and food security.

Resilience

CIWA is strengthening the ability of riparian countries to manage water resources and increasing their capacity to recover from, and adapt to, shocks. CIWA projects are at the forefront of local and national efforts to rebound from crises and build back better in their aftermath. Faced with the multiple effects of the global pandemic, climate change, conflict, fragility, supply chain disruptions, and economic downturn, riparian countries must leverage their shared water resources for maximum mutual benefit.

Both regional cooperation efforts and context-specific solutions have been important components of the strategies that CIWA partners are implementing in the HoA, the Sahel, and Lake Chad. They are using water resources to respond to challenges and leverage the opportunities posed by change to enhance access to groundwater, address the causes of fragility, strengthen gender equality, and improve biodiversity conservation.

CIWA continues to pivot to enhancing systematic and sustainable groundwater use to protect water access for food security, which is crucial for communities to cope with, and adapt to, shocks. For example, CIWA's support to the SADC Groundwater Management Institute (SADC-GMI) has enhanced sustainable groundwater development through water supply pilot projects implemented in villages in Botswana (Gobojango and Tsetsebjwe) and Zimbabwe (Dite and Whunga). In a region where at least 11 million people

are facing critical food shortages from drought, access to water for domestic and agricultural use (e.g., horticultural gardens) has a crucial impact on resilience. Through the Sahel Groundwater Initiative, CIWA is providing solutions to remove the constraints on the use of groundwater for small-scale and farmer-led irrigation in the Western Sahel.

To understand how poor water quality impacts people in the Lake Victoria region and to strengthen future project design and impact, CIWA's Great Lakes Water Quality technical assistance included a broad analysis of socio-economic indicators, a review of scientific and project literature, and community consultations on gender equality and social inclusion (GESI), focusing on livelihoods. NCCR is building on this work to influence regional water quality improvement. CIWA's Sahel Groundwater Initiative took a similar approach to ensure robust integration of the needs of women and other vulnerable populations including identifying ways to develop groundwater-based irrigation that is more accessible to women.

By strengthening the link between transboundary water management and freshwater biodiversity conservation, CIWA is supporting climate-resilient communities and playing a crucial role in planning for, and mitigating, climate-related shocks; supporting livelihoods; and sustaining health and economic development. In East Africa, for example, CIWA helped governments and RBOs strengthen governance mechanisms and the knowledge base to make more informed and inclusive investment identification decisions about biodiversity, such as in the Nile Equatorial Lakes Investment Program (NELIP) multicriteria analysis supported by Nile Basin Support Program (NBSP). NCCR will also use the multi-criteria analysis to identify opportunities to improve water quality in the Lake Victoria Basin and reduce regional environmental degradation. The Sahel Groundwater Initiative proposed the first typology of GDEs, highlighting their economic importance and identifying how groundwater resource management

that considers dependent ecosystems can best contribute to equitable and sustainable development.

CIWA works to enhance water management and cooperation to reduce the root causes of fragility. CIWA's support for transboundary collaboration and enhanced institutional capacity play a role in addressing cross-border tensions over scarce resources, thus mitigating potential conflicts. For example, the HoA borderlands, which are important conduits for trade and pastoralism, have few formal institutions that can regulate and facilitate economic activity, manage conflict, and provide basic services, which deepens inequality and insecurity. Support to the World Bank's new GW4R project, which includes Ethiopia, Somalia, Kenya, and IGAD, involves applied research and a state-of-the-art monitoring system, using the Geo-enabling Initiative for Monitoring and Supervision (GEMS) to track and learn about the role of groundwater in the borderlands, including in reducing fragility and conflict and enhancing resilience.

Nearly every Nile country experiences recurring seasonal floods, which threaten livelihoods and economic growth across the basin. The 2020 rainy season showed how serious the impacts can be—the water level of the Blue Nile in Khartoum, Sudan, was the highest in 100 years, and floodwaters caused tremendous damage in Ethiopia and South Sudan, affecting over 1.5 million people. CIWA's continued support to Nile countries through NCCR leverages the comparative advantages of Nile Basin Initiative (NBI), Nile Basin Discourse (NBD), and Lake Victoria Basin Commission (LVBC) to pivot toward improving flood and drought resilience. NCCR aims to develop and enhance the robustness of early-warning systems for droughts and riverine and flash floods, develop early-warning system dissemination strategies and awareness programs, create a flood management investment road map, and conduct capacity building for national governments.

To strengthen resilience in fragile borderland areas, CIWA supported the development of a framework to improve the design and implementation of resilience initiatives. The Strengthening Resilience in the Horn of Africa initiative used the Transboundary Resilience (T-Res) framework to inform and strengthen the design of GW4R. The approach allowed the identification of linkages between groundwater's role and key 'resilience levers' in the HoA (e.g., livelihoods, markets and

trade, local institutions and governance, and social cohesion), which strengthened the identification of project activities to maximize resilience impact in future activities in borderland areas.

CIWA approaches resilience building as a long-term, continual process that occurs across regional, national, sub-national, and community levels and among multiple sectors and stakeholders. To that end, CIWA's work is closely aligned with

the World Bank's 2025 Climate Change Targets, including boosting support for adaptation measures and elevating climate action in key sectors. CIWA's contribution to resilience also aligns with the Bank's Climate Change Action Plan 2021–2025, which aims to advance the climate change aspects of its green, resilient, and inclusive development (GRID) approach, acknowledging the vital importance of natural capital, biodiversity, and ecosystems services for mitigation and adaptation.



©Jeremy Bezanger/ Unsplash - Scene on the Nile River, Luxor, Egypt

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EAST AFRICA

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©Yukio Tanaka/ CIWA - Photo Caption: CIWA team's visit to the Rusuh Hills project, Tanzania, April 2022

East Africa faces a multitude of challenges, including food and water insecurity, growing violence and conflict, and climate change impacts. CIWA, which grew out of the progress made by the Nile Basin Trust Fund in water resources management and development in the Nile River Basin, is now working to enhance the region's resilience to worsening climate change and water insecurity, elevating the voices of civil society in decisions about water resources, and providing opportunities for riparian dialogue and hydro-diplomacy.

Engaging Civil Society for Social and Climate Resilience in the Nile

Context

Through the Engaging Civil Society for Social and Climate Resilience in the Nile Basin project, NBD strengthened civil society participation in development processes and programs to ensure that their benefits were equitable, contributed to building communities' climate resilience, and responded to community priorities. The NBD is the only organization in the region with the network, technical expertise, and resources capable of carrying out community-level dialogue. It has mobilized partnerships with governments and regional development organizations to ensure that social concerns shape water investments of transboundary significance.

Through its network of over 640 member organizations across 11 riparian countries, NBD worked closely with communities to elevate their voices; help them adapt to, and manage, risks; promote cooperation; monitor the impacts of investment

projects; and share knowledge on resilience-building strategies. The project closed in FY22, but CIWA support to NBD will continue through the NCCR project.

Progress

The project's accomplishments from its creation in 2014 until its closure are summarized below, and the Implementation Completion and Results Report is publicly available.³

Capacity building for NBD members to engage with Nile investment projects

NBD's role in transboundary investment dialogue is to provide opportunities for community members to voice their concerns and priorities about proposed projects and bring their perspectives to policymakers and project teams to maximize benefits for residents. The project financed 10 consultations across the following projects:

1. Nyimur-Aswa Multipurpose Water Resources Project (between Uganda

and South Sudan). NBD supported stakeholder consultations that surfaced community concerns about disruption to lives and livelihoods and the need for a permanent road to facilitate trade between Uganda and South Sudan.

The consultations influenced the location of irrigation facilities and led to the construction of a permanent access road between Uganda and South Sudan to facilitate trade in agricultural products and fish.

2. Rusumo Falls Hydropower Project (between Burundi, Rwanda, and Tanzania). The US\$470 million project, mainly financed by the World Bank and the African Development Bank, is expected to generate 80 megawatts of hydroelectric power and other livelihood-enhancing outputs. NBD asked communities for their priorities for projects to be financed under the Local Area Development Program, which agreed to finance piped drinking water, schools, health facilities, trading centers, pumps for irrigation, and activities to protect the watershed.

³ <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099700006172227110/p1324480813fb70608f71033fa872da9fd>



© Petr Kapuscinski - Fishing boats on Lake Victoria in Kisumu, Kenya

The consultations also reduced the number of households needing resettlement from an estimated 6,700 (40,000 people) to only 664 (4,000 people). This decision was made after community members voiced strong support for a run-of-river design option instead of an intermediary development scheme that would have generated more energy and involved a water storage reservoir. This helped the governments save money on compensation costs and reduced community disruption.

3. **The LEAF II Project (between Uganda and the Democratic Republic of Congo [DRC]).** NBD enabled community representatives to voice their priorities to the implementing agency for fisheries infrastructure that could contribute to peace and security in the region. Decision-

makers from the two countries authorized construction of a 223-kilometer road along three axes connecting Uganda and DRC (Mpondwe–Kasindi–Beni: 80 kilometers, Beni–Butembo: 54 kilometers, and Bunagana–Rutshuru–Goma: 89 kilometers), which community members had requested. Recognizing the role of women in the fisheries value chain, NBD also led consultations that improved gender outcomes. At the policy level, gender issues were included in the harmonization of fisheries regulations to ensure a legislative framework that supports gender equity, and, at the operational level, women participated in decision-making about lake and fisheries management.

4. **The Baro-Akobo-Sobat Multi-Purpose Water Project (between**

Ethiopia and South Sudan). The NBD helped communities understand the hydropower potential of the Baro-Akobo-Sobat Basin and related benefits. The dialogue also enabled communities to present their priorities for project funding, including activities to protect ecosystems and reduce poverty through post-conflict livelihood rehabilitation.

5. **The Mara River Water Resources Project (between Kenya and Tanzania).** In December 2021, NBD mediated dialogue between Kenya and Tanzania to help communities learn about the project's status and potential benefits and voice their priorities and concerns. Issues discussed included the development of multipurpose storage reservoirs for irrigation, domestic water supplies, small hydroelectric power plants, and implementation of integrated

watershed management approaches to protect the environment and promote alternative livelihoods.

Overall, nearly 900 people participated in the transboundary dialogues, exceeding the original target by 17 percent. Stakeholders who came to the dialogues were split equally between male and female participants, although the project had anticipated a targeted participation of 65% female participation.

NBD activities directly benefited 4,001 people (1,853 female, 2,148 male).⁴ NBD held women-only training sessions to reach more women and tried to ensure that they were well-represented during transboundary dialogues so that decision-makers would address their priorities.

Strengthening NBD Secretariat: delivery of key strategies and measures for the Secretariat's efficiency and sustainability

The project financed a stakeholder mapping⁵ exercise in 2015 of 11 Nile countries to understand the organizations, networks, and relationships among stakeholders involved in cooperation and development initiatives. This resulted in the identification of the geographical representation, thematic orientation, and capacities of civil society organization (CSO) members of the National Discourse Forums (NDFs).

In 2016, the project financed the preparation of strategies for

communication and outreach, monitoring and evaluation, and financial sustainability and supported the NBD Strategy 2018–2022. The NBD Secretariat implemented many of the strategic recommendations, including measures to strengthen communication and outreach and monitoring and evaluation.

To further guide its efforts toward NBD's financial sustainability, the project financed the NBD Fundraising Plan 2022–2025, whose recommendations the organization is exploring to mobilize funding from development partners and NGOs.

NBD has already implemented several measures, including providing fee-based consulting services, training, and provision of data on flood risk collected through citizen science.

NBD has raised funds from three donor partners along with CIWA, although it did not meet its target of four. The Coca Cola Foundation and IHE Delft Institute for Water Education provided funding from 2017 to 2019 and Germany's Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) provided funding in 2022 to implement the Women and Water for Change in Communities project. While CIWA is supporting NBD through NCCR, currently there is only enough funding to maintain the Secretariat for another two years.

Improving communication and outreach to increase member satisfaction

Strengthened communication channels helped build the capacity of CSOs and citizens and enabled coordination among organizations working on related issues, which increases civil society voices in development projects. NBD also raised its public profile through 36 media mentions, including seven in the project's final year.

Next Steps

Despite efforts to raise funds, NBD has struggled to achieve financial sustainability, a critical challenge that requires focused attention. The synergies between NBD and NBI offer opportunities for joint fundraising; however, joint financing arrangements must ensure that NBD remains independent to continue being a trusted interlocutor between communities and investment planners.

NBD's partnership with NBI through NCCR ensures that both organizations can more effectively contribute to cooperation over shared waters. NBI helps identify and prepare transboundary projects that government leaders prioritize, while NBD engages with communities to assess their needs and gain their support for those projects. Given that NCCR funding for NBD will only support two thematic activities and core functions for the next two years, it is imperative for NBD to quickly identify additional resources.

Bringing all Nile countries together around a common growth-oriented goal and leading to tangible benefits for the basin's population

⁴ Including people participating in training events, workshops, NBD/NDFs governance meetings, and transboundary dialogues.

⁵ <https://nilebasindiscourse.org/e-resource-center/workshop-research-reports/nbd-nile-basin-countries-stakeholder-mapping-of-csos-network-members-and-their-partners,-2015.html>

Nile Basin Support Program

From its inception in 2013 to its closure in 2022, the Nile Basin Support Program (NBSP) complemented three projects through a US\$1.66 million Bank-executed grant from CIWA—Nile Cooperation for Results (NCORE), Engaging Civil Society for Social and Climate Resilience, and NCCR.

NBSP provided opportunities that had not been possible under existing institutional structures including riparian dialogue, innovative and disruptive technology adoption, and investment planning.

The program also provided global expertise and technical support to help NBI and Nile countries advance development of public-private partnerships (PPPs) for investment projects,⁶ remote-sensing data applications, environmental and social safeguards, and integration of gender equality into NCCR project design. Highlights of program outcomes include:

Hydro-diplomacy

NBSP conducted international study tours for water resources management staff to learn best practices, provided technical assistance through regional workshops and media training and facilitated consultations. The consultations, which notably included Egypt's participation, focused on approaches to inform joint basin-wide cooperation on reservoir management and flood forecasting. This flexible approach has allowed the Bank to provide support to encourage cooperation and apply new technologies for an improved understanding of the water resources situation in the basin. This support provided access to innovative analytical tools that strengthen capacity to conduct

spatial analysis and remote sensing, improve environmental sustainability, and enhance economic and financial benefits through cooperation.

Investment Planning

While NCORE was developing many new potential investments in water resources development, it became clear that a strategic framework was needed for their prioritization. NBSP supported NBI to (i) develop a framework to support cooperation (e.g., to define guidelines for the Nile Investment Program [NIP]), (ii) identify measures to strengthen regional institutions, (iii) prioritize and sequence cooperative regional investment projects, and (iv) contribute to the knowledge base required to underpin priority regional investments. NIP planning is continuing with support from the European Union.

In parallel with NIP, the Nile Equatorial Lakes Subsidiary Action Program Coordination Unit (NELSAP-CU) consolidated independently prepared investment projects by member countries into a single Nile Equatorial Lakes Investment Program (NEL-IP).⁷ Both pipelines would be highly visible, country-driven, multi-sector investment projects, bringing all Nile countries together around a common growth-oriented goal and leading to tangible benefits for the basin's population. The pipelines would be an effective response to the region's daunting economic, environmental, and geopolitical challenges through coordinated investments at basin and sub-basin levels that consider the growing water-energy-food-environment (WEFE) nexus.

NELSAP-CU developed and reviewed 15 regional screening criteria for investments with member countries. Using a decision support tool created by NBI, these criteria have been applied to prioritize 128 potential projects. National stakeholders (Technical Advisory Committee [TAC] and Council of Ministers [COM]) compared the pros and cons of various combinations of development options, placing an emphasis on energy security, food security, employment, beneficiaries, investment cost, and revenue. By totaling individual project priorities within each scenario, the food security scenario—with 17 projects and a good balance of country representation—ranked highest.

NBSP also supported NELSAP-CU to help member states (Burundi, DRC, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda) meet challenges in resource mobilization by leading the countries through a PPP screening process to build capacity in pursuing these partnerships. While the activity has not yet led to concrete investments, PPPs are central to NELSAP-CU's approach.

Innovation for Development

Nile Basin countries have an urgent need for improved hydrological data to inform WRM and decision-making processes. Innovative and disruptive technology can help countries improve their understanding of flood events and operation of infrastructure, even in the absence of field data and data-sharing arrangements.

NBSP supported the Eastern Nile Technical Regional Office (ENTRO)

⁶ <https://blogs.worldbank.org/ppps/harnessing-nile-s-potential-through-private-finance>

⁷ <https://nelsap.nilebasin.org/index.php/en/media-items/factsheets/36-nelip-program-brief-april-2020/file>

in using satellite-based flood area maps of previous events and flood recurrence maps to increase knowledge about flood dynamics and their impact. This helped improve the accuracy of the model and ENTRO's monthly flood bulletins for member states. Successfully piloted in the Eastern Nile, this work is being scaled up to calibrate flood models for the Nile Equatorial Lakes (NEL) region under NCCR.

The NBSP also implemented a pilot of Water Accounting+ (WA+)⁸— a model suite of tools that can assess the sources, availability, and uses of water based on publicly available earth observation technology producing remotely sensed (RS) data and global datasets. This tool enables a modeler to conduct basin water balance assessments without the

need for field data, a major cost savings because it requires less primary data. This activity also integrated the Data Cube, an open-source repository and analysis platform of earth observation data, which has the potential to increase the efficiency of WA+ implementation and facilitate scale-up.

Primarily positioned as a planning and usage assessment tool, WA+ can verify impacts and benefits of investments on water availability at the basin or sub-basin level, a requirement of the World Bank's Environmental and Social Framework. The pilot has been implemented in the Mara sub-basin shared by Kenya and Tanzania. WA+ and other knowledge platforms are available at NBI's Integrated Knowledge Portal.⁹

Next Steps

The support provided under this program has been an important catalyst for the recipient-executed NCORE project and the subsequent development of NCCR, as it has brought innovation and new tools and provided an important avenue for maintaining a more basin-inclusive dialogue, especially amid the broader challenging hydro-political situation. The tools deployed with the NBSP have been used in joint decision-making by the Council of Ministers to establish the existing investment and project pipelines. In addition, NCCR has benefitted from the inclusion of additional partners—NBD and the Lake Victoria Basin Commission (LVBC), thus increasing the reach of this support. While NBSP closed in October 2021, a potential new phase is envisioned pending funding.



Alumni from the 2nd NCCR Internship batch and ©ENTRO Team, Addis Ababa, Ethiopia, June 2022

8 <https://www.wateraccounting.org/>
9 <http://ikp.nilebasin.org/>

Nile Cooperation for Climate Resilience

Context

Begun in 2021, the NCCR project continues CIWA's longstanding engagement in the Nile River Basin by building resilience to water insecurity and transforming water management infrastructure to mitigate increasingly intense impacts from climate change. The project provides direct support to NBI's three centers (the Nile Secretariat [Nile-Sec], NELSAP-CU, and ENTRO), NBD, and LVBC to collaboratively deliver components in flood- and drought-risk mitigation, dam safety capacity building, water quality investment planning and prioritization, the platform for cooperation, and innovative information services for climate-resilient investment planning. Despite worsening inter- and intra-state violence and conflict, COVID-19 consequences, and food and water insecurity in the region, the project has continued to strengthen inclusive development. CIWA's support to the Nile Basin enhances the iterative processes that build cooperation—such as trust building, social capital, and a common long-term strategic vision.

Progress

Platform for Cooperation

The Platform for Cooperation enables countries to make collaborative decisions on a range of issues (e.g., approving investment pipelines, basin-wide programs, and regional strategies), including basin investment plans and water resource management. It encompasses all of NBI's mechanisms that facilitate cooperation by providing a forum for regional consultation, planning, and decision-

making. It also helps communicate the benefits of cooperation to a wider audience. NBI held national stocktaking consultations in the DRC, Burundi, Kenya, and Tanzania to evaluate the efficacy of platforms across the NBI centers and NBD. NBI also participated in the World Water Forum in Dakar, Cairo Water Week, and Uganda Water and Environment Week.

Enhancing NBI's communication with governments and civil society is a priority to improve the organization's position as a valued service provider through NCCR.

NBI's NELSAP-CU developed corporate brand communication products (e.g., newsletters, project briefings, and posters), conducted a media briefing in Uganda and media trainings in Uganda and Rwanda, and trained staff on information technology and safeguards. Notably, NELSAP-CU also hosted a workshop for all three NBI centers to develop country-specific reports for DRC and Burundi on the benefits of transboundary water resource cooperation. These activities are envisioned to lead to joint decisions that will demonstrate improved cooperation on water resources management and development as they involve shared policies, systems, and information among member states that form the basis for decision-making around water management and development.

Information Services for Climate-Resilient Investment Planning

A Nile Basin Data and Analytics Services (NB-DAS) activity is underway through NCCR to improve access to a large volume of online data (especially leveraging powerful online services from earth observation and public-domain data

from global and regional institutions including the NBI and its members) and cloud analytics. This activity is expected to help fill critical gaps including by providing synoptic, multi-sectoral insights into the Nile Basin and be integrated into customized dashboards, decision support tools and interactive e-documents. DAS needs assessments have been completed for Kenya, Burundi, and Tanzania; some NBI information technology systems have been augmented; and a consultancy is at the final stages of being procured to provide additional technical assistance.

In October 2021, Nile-SEC conducted a hybrid training program for 286 participants on the Group on Earth Observation Global Water Sustainability (GEOGloWS)—European Center for Medium-range Weather Forecasting (ECMWF) Streamflow¹⁰ cloud- and Python-based computing for hydrologic data analysis, Nile-SEC tools and systems (e.g., river flow forecast system, integrated knowledge portal, and drought monitoring and forecasting), and GEOGloWS ECMWF Service Data Access and Bias Correction with Python. NBI disseminated quarterly basin monitoring bulletins and monthly drought monitoring and forecasting bulletins. Nile-SEC also conducted needs assessments on the NB-DAS for Burundi, Kenya, and Tanzania, with more to be conducted next year.

Water Quality Investment Planning and Prioritization

The new Water Quality Technical Working Group (WQTWG) held its first meeting in December 2021 to review and agree on criteria for identifying regional water quality hotspots. The literature review report, the full list of hotspots,

10 <https://geogloWS.ecmwf.int/>

and the screening criteria were finalized in April 2022.¹¹ Country consultations to collect data for the baseline study for selected water quality/pollution hotspots at the Lake Victoria Basin, lake bays at Kagera/Akagera, and Lake Tana at the confluence between White and Blue Nile are expected to start in early FY23.

Flood and Drought Risk Mitigation

Conflict and instability in the Eastern Nile prevented community and gender assessments from being conducted, but the Bank leveraged Global Facility for Disaster Reduction and Recovery (GFDRR) funding to pilot a community GESI assessment in flood-prone areas of Juba, South Sudan. Pilot results indicated that the primary gender gap is in literacy rates, particularly in certain age groups, which would impact the utility of a future flood early-warning system. The pilot is expected to be scaled up and combined with results from larger assessments to inform the design of improved flood early-warning systems. ENTRO will hold a regional consultation workshop to assess drought-forecasting needs and perform a baseline topographic survey and data collection for improving the flood-forecasting and early-warning system. NELSAP-CU has also commissioned the development of a flash flood early-warning system for the entire basin.

NBI provided monthly drought monitoring and forecasting bulletins and three basin monitoring bulletins to its stakeholders.

Dam Safety Capacity Building

ENTRO and NELSAP-CU completed five of the six priority dam safety trainings planned for the project's first year, which focused on overall dam safety management, surveillance, and instrumentation and analysis of potential failure modes. The two major activities under the component have begun to develop a basin-wide (i) dam safety framework and associated guidelines, which is being led by ENTRO, and (ii) inventory of dams and risk management frameworks, being led by NELSAP-CU.

ENTRO is coordinating the Dam Safety Technical Working Group, which met for the first time in March 2022. A complementary Bank-executed grant from the Japan-World Bank Program for Mainstreaming Disaster Risk Management in Developing Countries is also supporting dam-safety capacity building, which will leverage additional expertise and innovative technologies for greater effectiveness and impact of CIWA-funded activities.

Next Steps

NCCR has leveraged funding from the Korean Green Growth Trust Fund, a World Bank-executed trust fund, which will enable the preparation of

a regional strategy for Lake Victoria-Wide Inclusive Sanitation. It will explore opportunities for promoting private sector participation and job creation, technology adoption, and improved efficiency in water sanitation and reuse.

In early FY23, NBD will launch a regional grassroots women's network, which will provide a platform for women's engagement in integrated water resources management (WRM) to influence projects under preparation and implementation. Identification of national network representatives and country network meetings are expected to begin in September 2022, followed by the first regional network meeting in February 2023.

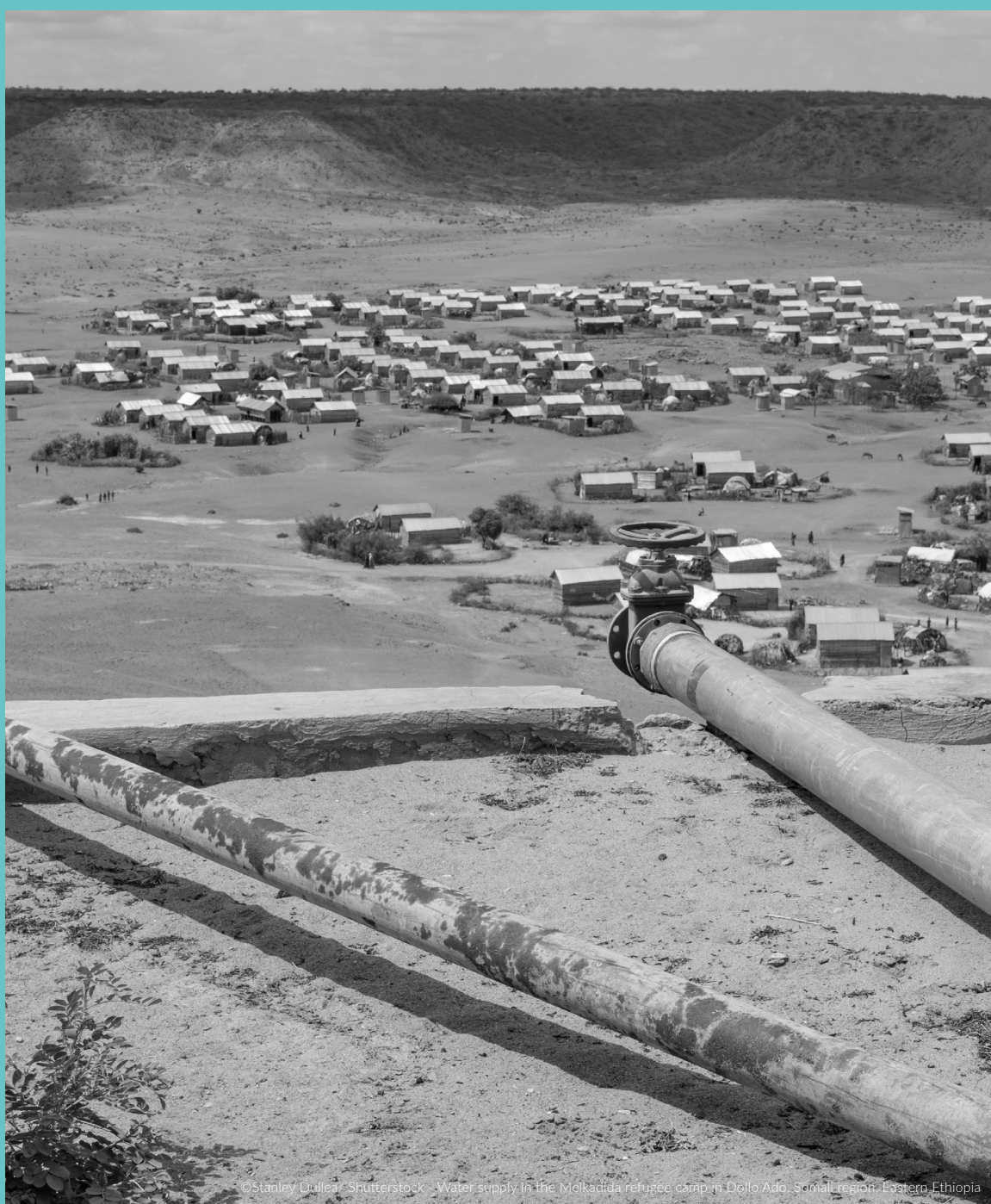
The project's ability to achieve its goals hinges on successful collaboration between the implementing agencies. While there has been notable coordination among the agencies across thematic areas, more work is needed to institutionalize such arrangements. The meetings of the technical working groups (which also include a group on floods and droughts) and capacity-building activities have helped improve collaboration between working groups and national counterparts. However, working groups need to embrace the project's objectives and activities so they can work with their respective country systems to achieve project targets.

Assess drought-forecasting needs and perform a baseline topographic survey and data collection for improving the flood-forecasting and early-warning system



A View from the Field:

Tackling Water Security and Resilience in the Nile Basin



Water, food, and energy insecurity. Rapid population growth and urbanization. Political conflict and tension. These stresses, all exacerbated by climate change, affect many parts of the developing world, but no more so than in the Nile Basin.

Just ask Isaac Alukwe, Regional Coordinator for NELSAP-CU, who works closely with the NCCR project. “Most climate change models agree that surface temperatures will rise in the Nile Equatorial Lakes region, which will translate into more demand for water,” he says. “Water shortages will be a key constraint in the coming decades to realize both food and energy security and fulfill countries’ development plans.”

What’s more, he says, “critical ecosystems, habitats, and biodiversity assets of world significance will be at risk, if not extinct, if countries do not intervene on time.” And while countries must collaborate to secure water resources and safeguard the environment, Alukwe adds, “politics, tensions, and suspicions among Nile Basin states,” not to mention armed conflict in Ethiopia and Sudan, are an impediment to cooperation.

That’s why NCCR is so critical for the region’s water security.

“NCCR is promoting and building trust, confidence, and interaction among countries through joint capacity building,” he says.

The project supports regional capacity-building training to build skills and enhance collaboration and encourages dialogue so that when an upstream country experiences heavy rainfall, for example, it will notify its downstream neighbor to expect flooding. Alukwe cites the positive outcome when CIWA (and its predecessor, the Nile Basin Trust Fund) brought together Rwanda, Tanzania, and Burundi, which enhanced cooperation and overcame tensions to develop the Regional Rusumo Falls Hydroelectric Project. CIWA’s former NCORE project contributed to the implementation of the investment, which is nearing completion.

Despite the region’s challenges, Alukwe is optimistic about the opportunities that will emerge from NCCR’s efforts to promote dialogue and cooperation.

“Areas of opportunity for cooperation that will allow Nile Basin states to reach favorable development outcomes for all include management of the environment, watersheds, groundwater, wetlands, dams and dam safety issues; flood and drought forecasting and early warning; and climate change mitigation and adaptation,” he says. “If well planned, there are lots of win-win development opportunities with shared benefits at the transboundary level.”

NCCR, which is expected to lead to investments in subsequent years, is “a very important funding window supporting collaboration, which will also enhance country preparedness and resilience against shocks from climate change,” he says.

The bottom line for Alukwe is that CIWA’s efforts to spark transboundary cooperation “will contribute to stability, peace, and prosperity for all riparian countries.”

WEST AND CENTRAL AFRICA

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West and Central Africa faces increased climate impacts, including prolonged drought and unpredictable rainy seasons causing flooding in the Sahel, which also suffers from fragility, violence, weak institutions, and political instability. In a region with widespread gender inequality, women are more affected than men by these conditions. CIWA worked to improve water resources management by identifying investments and policy actions and addressing knowledge and capacity gaps. It also conducted a Water Security Assessment in Lake Chad as the first step toward developing a transformative water security framework for addressing the region's challenges.

Improving Water Resources Management in West and Central Sahel

Context

The Improving Water Resources Management in West and Central Sahel technical cooperation is a three-year initiative that identifies pragmatic investments and policy actions and addresses critical knowledge and capacity gaps. It recommends investments and policy actions that can be supported by future operations and fit-for-purpose WRM assessments and technical assistance. While this initiative is focused on WRM challenges, its design recognizes the interdependence of water resources with other sectors. All engagements under this activity proactively account for climate change impacts and specific challenges in FCV environments, such as volatility and violence, low capacity of state institutions, and protracted political crises.

Seven engagements were selected following client and Country Management Unit (CMU) consultations in 2020. These include three country-level engagements (Burkina Faso, Cote d'Ivoire, and Ghana), one regional engagement, and three regional thematic

activities. The activities, which were co-financed by the CMUs, focused on Burkina Faso, Cote d'Ivoire, Ghana, and the G5 Sahel.

Progress

Burkina Faso—Mobilizing Water Resources for Development

The “Burkina Faso—Mobilizing Water Resources Policy Note” prepared in FY21 has served as the basis for discussions between the World Bank and the government of Burkina Faso on potential approaches for addressing the major water security challenges. The policy note informed the Performance and Learning Review of the Country Partnership Framework and has inspired a new IDA-financed Program-for-Results (currently under preparation) focused on water security, including its trans-boundary dimensions.

The note also focuses on challenges and opportunities in the management of transboundary waters, especially in the Volta Basin and makes recommendations, including a preliminary costed action plan

and prioritized investments. These recommendations have helped conceptualize a new integrated water security lending project to be financed by the World Bank.

Cote d'Ivoire—Gaps Assessment for Water Resources Management

Côte d'Ivoire's challenges in managing its water resources include the need to update the assessment of water resources availability and demand. The national hydromet system suffered serious setbacks during the long period of internal conflict and is now gradually being rehabilitated.

While the country relies heavily on groundwater, it lacks sufficient information on aquifers, sustainable yields, and current levels of abstraction. An initial study, Mobilization of Water Resources for Development in Côte d'Ivoire, provides a framework for addressing challenges such as managing increased demands from water-using sectors, trade-offs between allocations to various sectors, the unequal distribution of water between and within regions, water

quality, and safeguarding water resources for future generations.

The draft report presents a summary of Côte d'Ivoire's geographic and climatic context, work on water resources issues, the physical resource base, and knowledge and institutional issues.

It is also shaping the design of the water resources management components for the integrated water security project being prepared for potential World Bank financing.

Ghana—Addressing Critical WRM Challenges

A rapid diagnostic was conducted to inform WRM interventions that sustainably support livelihoods in northern Ghana, recognizing the role of water security in supporting economic growth and reducing migration and conflict.

The diagnostic identified seven key challenges¹² to Ghana's management and use of its water resources, especially in the context of climate change and FCV, which provided a framework for discussions between the government and the World Bank on future investment priorities and related policy and institutional actions. The diagnostic also identified the challenges and opportunities in advancing transboundary cooperation in the Volta Basin, focused on opportunities for cooperation with Burkina Faso. This diagnostic has served as the analytical basis and a door-opener for a new operation, focused on water security (including transboundary dimensions) as the basis for rural development and growth in northern Ghana.

West Africa Transboundary Waters Retrospective

The West Africa Transboundary Waters Retrospective report,¹³

delivered in 2021, examines the World Bank's engagement in transboundary waters in the region over the past 20 years to derive lessons that can inform future engagement. The

report concluded that knowledge generation had focused on technical assessments of water resources and their management but not on detailed economic analysis of the sector's influence and importance in the broader economy and across stakeholders. This was particularly the case for FCV-affected countries, where the linkages between water and conflict are broadly understood but have yet to be analyzed in detail. The report suggested that such work could lead to better integration of these issues in regional and country diagnostics and entry points for further engagement in transboundary waters.

The retrospective found that, while river basin organizations (RBOs) have been the preferred partner to foster collaboration on transboundary waters, past RBO engagements may have limited the Bank, leading it to reexamine both its role and priorities for the region.

One alternative approach could be to integrate RBOs, national governments, and civil society and develop clear articulation/sequencing of interventions at the policy, program, or project level to ensure they are creating the most value.

The report led to a new approach in project design (described in the report *Strengthening Regional Water Security for Greater Resilience in the G5 Sahel*), in which instability and conflict are expected and combating them are central to the approach (the *Integrated Problemsheds Approach*¹⁴). For new projects, this means moving to smaller, decentralized investments including practices such as soil moisture conservation and subsurface water storage/management.

Strengthening Water Security in the G5 Sahel (Regional)

The World Bank's water portfolio in Africa underwent significant consolidation in 2019-20, which underscored the need to revisit its strategy for the next phase of

Bank engagements in the region.

The G5 Sahel has an opportunity to improve water security to boost socio-economic development and reduce fragility and conflict. A water security framework, applied at all levels, sometimes is a more appropriate entry point to address these challenges than those presented by a river- or RBO-centric perspective.

This activity completed the water security report¹⁵ in FY22, which expands the scope of water interventions.

These measures (i) encompass the whole spectrum of water resources, including groundwater, river, and rain and runoff, instead of focusing solely on transboundary river basins; (ii) improve integration of multiple water uses (urban and rural water supply and sanitation, irrigation, rainfed farming, pastoralism, and fisheries), and (iii) address broader questions of fragility and conflict.

The report presents a high-level analysis of water security challenges and their impacts on socio-economic development and stability and suggests directions for Bank engagement.

This report is providing a basis not only for deepening the dialogue with counterparts in the region, but also for conceptualizing the vision for a regional water project in the G5 Sahel area. Discussions are now ongoing to develop a pragmatic vision that responds to needs across various dimensions (e.g., increasing storage, addressing floods and droughts, and providing basic services) by supporting appropriate interventions at local, national and basin/aquifer levels.

Operationalizing Strategic Storage in the Western Sahel (Thematic)

Small-scale and nature-based solutions are critically important for providing reliable water storage to rural communities. With CIWA support, the World Bank has

12 1. Lack of evidence-based decision making 2. Poor basin management 3. Weak transboundary management 4. Poor water supply 5. Poor sanitation services 6. Low access to and inefficiencies in irrigation service delivery 7. Managing risks of water-induced disasters

13 https://www.ciwaprogram.org/wp-content/uploads/CIWA_World-Bank-Engagement-Transboundary-Waters-West-Africa.pdf

14 <https://blogs.worldbank.org/water/integrated-problemsheds-solution-water-security-g5-sahel>

15 <https://www.ciwaprogram.org/wp-content/uploads/Strengthening-Regional-Water-Security-for-Greater-Resilience-in-the-G5-Sahel.pdf>

collaborated with a consortium of international partners to develop the “Water Harvesting Explorer,” a decision support tool for small-scale water storage planning. This tool, with its beta version now operational, provides options for water harvesting at any location, based on the local biophysical conditions including precipitation, slope, and land cover. The tool uses global datasets and draws on the WOCAT Repertory of Sustainable Land Management to suggest intervention options that can be narrowed through community consultations and local validation.

The tool is being deployed to train implementing agencies in Niger and Nigeria on its use for investment identification and community consultations for new investment projects. Currently, its application is limited to the Western Sahel, but other regions would like to use the tool and expand its functionality.

Identifying Partners for CSO Water Dialogue in Western Sahel

The interdependence on limited water resources across national boundaries makes coordination among stakeholders, including civil society, critical. CSOs have the potential to advance a water security agenda and contribute to the region’s socio-economic development including ensuring a focus on GESI. A draft report, Mapping Civil Society Organizations in the Sahel, addresses two themes: (i) identification of CSOs and their institutional relationships and analysis of the policy and legal landscapes for CSOs and (ii) generation of tools for leveraging Community-Based Associations (CBAs).

The study, which was completed in FY22, concluded that while the Sahel has many CSOs, the depth and sufficiency of the legal environment in which they operate varies widely and their participation in the development of national and sectoral policies is sufficient only in Burkina Faso. The Niger Basin Authority is CIWA’s obvious natural partner, as it has been successful in discrete functions, but it has limited reach in certain countries.

Emulating the NBD model will require a better understanding of CBA needs and collaboration with NGOs to facilitate vertical communication with governments. It is proposed to move closer to operationalizing the model by: (a) working closely with selected CSO/ NGO partners in a few countries, and (b) in parallel, initiating dialog with basin-level counterparts (such as OMVS and NBA) for integrating such broad-based engagement in their core agendas.

Next Steps

The analytical work in Burkina Faso, Cote d’Ivoire, and Ghana has led to preparation of new country-level projects, with potential support for transboundary water management (in Burkina Faso and Ghana). New proposals are being prepared for CIWA support including a regional transboundary project in the Niger River Basin/G5 Sahel region and a transboundary project in the Senegal River Basin supporting community development anchored around water infrastructure.



©Basile Ouedraogo/ WaterAid - West African woman noting the water meter reading.

Lake Chad Transboundary Water Security

Context

Flooding from shorter, more intense, and less predictable rainy seasons has been wreaking havoc in the Sahel and is likely to intensify. Climate change is fueling fragility and conflict over water resources, with people experiencing a vicious cycle of water insecurity and fragility. Within the Sahel, Lake Chad has significant livelihood, health, and ecological importance, particularly because of its permanent and seasonal freshwater marshes, rivers, and deltas in the lake's wetlands. These support a diverse, abundant socio-ecological system that links people and nature. To address threats stemming from conflict, instability, migration/displacement of populations and climate change, CIWA is supporting a new round of dialogue under the Lake Chad Transboundary Water Security project.

A key deliverable will be the Lake Chad Transboundary Water Security Assessment (WSA), which builds on lessons learned from the past 20 years of regional engagement of national and international institutions, including the World Bank. This assessment will present a transformative water security framework by expanding the scope of interventions to encompass the whole spectrum of water resources, including groundwater, and better integrating multiple water governance systems/layers beyond RBOs, especially in contexts susceptible to fragility and conflict.

Progress

For the WSA, CIWA, in collaboration with the Lake

Chad Basin Commission (LCBC), developed a detailed problem matrix to identify key challenges and map organizations and projects to address challenges.

In the first quarter of 2022, CIWA held a consultation with several key organizations including Germany's GIZ, the United Nations Development Program, and the UN's World Meteorological Organization, all of which work on water issues in the basin. In addition, some preliminary work began on deep-dive analyses of specific issues and a hydrometric monitoring assessment, which will continue full-throttle next year.

This technical assistance is also providing support to the LCBC to assess its capacity for hydrometeorological monitoring and data management. This work comes in response to client requests for water information to be used for planning, investments, early-warning systems, research, and communication.

Next Steps

The team planned to complete a short draft of a WSA in July 2022 for discussion among internal and external stakeholders. A full draft, expected in September 2022, will help guide the development of deep-dive analyses of potential solutions to address issues such as groundwater, hydromet systems, and conflicts over water, which will then be shared with stakeholders, during a seminar to be held in October in close collaboration with LCBC, to prioritize recommendations.

The deep-dive analyses and hydrometric monitoring assessment will involve national and CSO consultations later in 2022. The analysis on water and the climate-conflict trap will build on the findings from the Regional Economic Memorandum and focus on the potential of water to contribute to regional development and mitigation of climate and conflict-related risks. The analysis on groundwater will focus on recommendations for activities and on legal and institutional aspects to strengthen implementation of the LCBC's mandate, while the analysis on CSOs will assess the feasibility of a dialogue platform modeled on NBD to empower civil society in discussions about investments. The assessment of hydrometeorological monitoring and data management capacity will involve interviews with national agencies to identify gaps in information gathering and exchange.

A regional stakeholder meeting is planned for late 2022 or early 2023 to review the WSA and deep-dive analyses and develop recommendations for water priorities. A round of more focused workshops to gather feedback from the field and finalize these products is expected in early 2023. The engagement will improve understanding of the perspectives and priorities of countries and overall basin. The workshops will also obtain stakeholder feedback and buy-in to identify key water security needs, improve the model for supporting transboundary waters management, and continue advancing progress toward recipient-executed work.

A View from the Field:

Water Security Is the Way Out of the Conflict-Climate Risk Trap in Lake Chad Basin



The rich biodiversity of Lake Chad, its wetlands, and watercourses provides important ecosystem services and supports livelihoods, especially those of fishermen, herders, and farmers in the countries that share the lake—Cameroon, Chad, Niger, and Nigeria—and parts of the Central African Republic that are in the lake’s active hydrological basin.

Yet this large, productive basin also faces profound challenges, including climate shocks and some of the world’s highest concentrations of extreme poverty, conflict, and terrorism that force massive displacement and weaken the economic and social fabric of communities. The basin’s population is caught in a conflict-climate risk trap with, on one hand, political, social, and security stressors overwhelming governments and, on the other hand, climate change causing greater climate variability, including changes in rainfall patterns, more uncertainty, and, therefore, more risk of conflict.

Hycinth Banseka, LCBC technical director, who, along with other LCBC staff, is working with CIWA on its assessment to develop a transformative water security approach, explains how climate change, insufficient access to water, and conflict interact to harm local communities. Higher temperatures and evapotranspiration decrease availability of water resources for people’s livelihoods and economic activities, leading to conflict. For example, in Cameroon, diminished water quantity has led some fishers to divert water from streams by digging canals to create small ponds for raising fish. But the canals cross plains where grazing cattle fall into the openings and break their necks, jeopardizing herders’ livelihoods.

Last year, ethnic violence erupted between herders and fishers in two tribal communities in northern Cameroon that were already plagued by violence from the militant group Boko Haram. The fighting left at least 12 people dead in one week and caused thousands of people to flee their homes. While violence is not new, “escalating impacts of climate change and water scarcity” are likely to provoke more conflict if water access isn’t improved, Banseka says.

“We cannot do much about climate change,” he says. “What we can do is improve practices” to use water more efficiently and reduce the harm to water resources.

At the same time, conflict and displacement have a negative impact on water security. More than 3.2 million people in the basin have been displaced, including 2.4 million from the Boko Haram insurgency in Nigeria. Displaced women are particularly vulnerable, as the precarious conditions they are forced to work under such as limited water supplies and the use of manual wells expose them to physical hardship and gender-based violence.

The water needs of refugees living in camps put stress on local water resources, causing tension with hosting communities.

“If you have a community that has only one or two boreholes that provide drinking water,” Banseka says, “how do thousands of refugees get water? This causes strain and, in turn, more conflict risk with communities.”

The key to resilience is improving water resources management and promoting more equitable access.

“We need to develop strategies to ensure that wherever people live, they have access to the water that they need, which will minimize internal conflicts,” Banseka says. This will allow people to develop their economic activities and maintain their communal organizations and ties, which will make them more resilient to climate shocks and resistant to extremist threats.

Water security is also the key to sustainable development. “You can’t have development in an insecure environment,” Banseka says. “The question is: how do we improve security and gradually migrate from emergency response to development?”

CIWA’s Lake Chad Transboundary WSA, which is examining the risk factors—especially climate change—that drive vulnerability, water insecurity, and conflict, will contribute to efforts by the World Bank and other donors to help the region prosper.

Sahel Groundwater Initiative

Context

Given water scarcity in the Western Sahel (Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal), the impact of climate change, and the need for sustainable management of groundwater resources at both regional and national levels, this technical assistance has three goals. It aims to: (i) support equitable groundwater-irrigated agriculture (by removing the constraints and limitations on the use of groundwater for small-scale irrigation); (ii) evaluate opportunities for development of groundwater resources by reviewing the status of groundwater assessment and exploration capacity; and (iii) strengthen groundwater expertise and ensure equitable participation of men and women by facilitating regional cooperation on developing the next generation of groundwater experts.

Progress

Improving access to groundwater for irrigated agriculture

Pillar 1 focuses on removing key barriers that limit access to shallow groundwater for smallholder farmers. This component consists of identifying innovative technologies to make groundwater available for irrigation and exploring the technological aspects of shallow drilling and shallow-water abstraction to optimize farmers' investment and operation costs.

Following reviews of groundwater irrigation techniques and gender barriers in FY21, the technical assistance completed a review in FY22 of shallow groundwater irrigation technologies used elsewhere, particularly in Africa and South Asia. The review

informed the design of two pilot activities that have been prepared for three regions in Burkina Faso (Hauts-Bassin, Centre, and Centre-Sud) and two regions in Chad (Chari-Baguirmi and Mayo-Kabbe-Est), which contain large areas of groundwater in shallow basement rock and alluvial aquifers. Priority is given to addressing hand-dug well construction and barriers to it through a series of demonstrations at multiple small farm irrigation sites. The main pilot program components focus on so-called agro-wells, standard open wells, low-capacity solar-powered pumping systems and related efforts, and gender-equitable cooperatives.

The activity's gender assessment identified that leaders of the plots should be women and farming systems should include women/mixed gender/youth cooperatives and women farmers who are heads of households or single-family farmers. Technological support to women's cooperatives would address disadvantages that women face in land ownership, recognition by local authorities, financial backing, training, and agricultural techniques.

Assessing opportunities for development of groundwater resources

Pillar 2 reviews the status of groundwater and exploration capacity in the Western Sahel by assessing gaps in groundwater resource conceptualization, quantification of sustainable groundwater resources, and scientific cooperation on transboundary aquifer systems.

This component will result in an overview of knowledge gaps and governance issues regarding groundwater resources in the Western Sahel, following the main regional hydrogeological units:

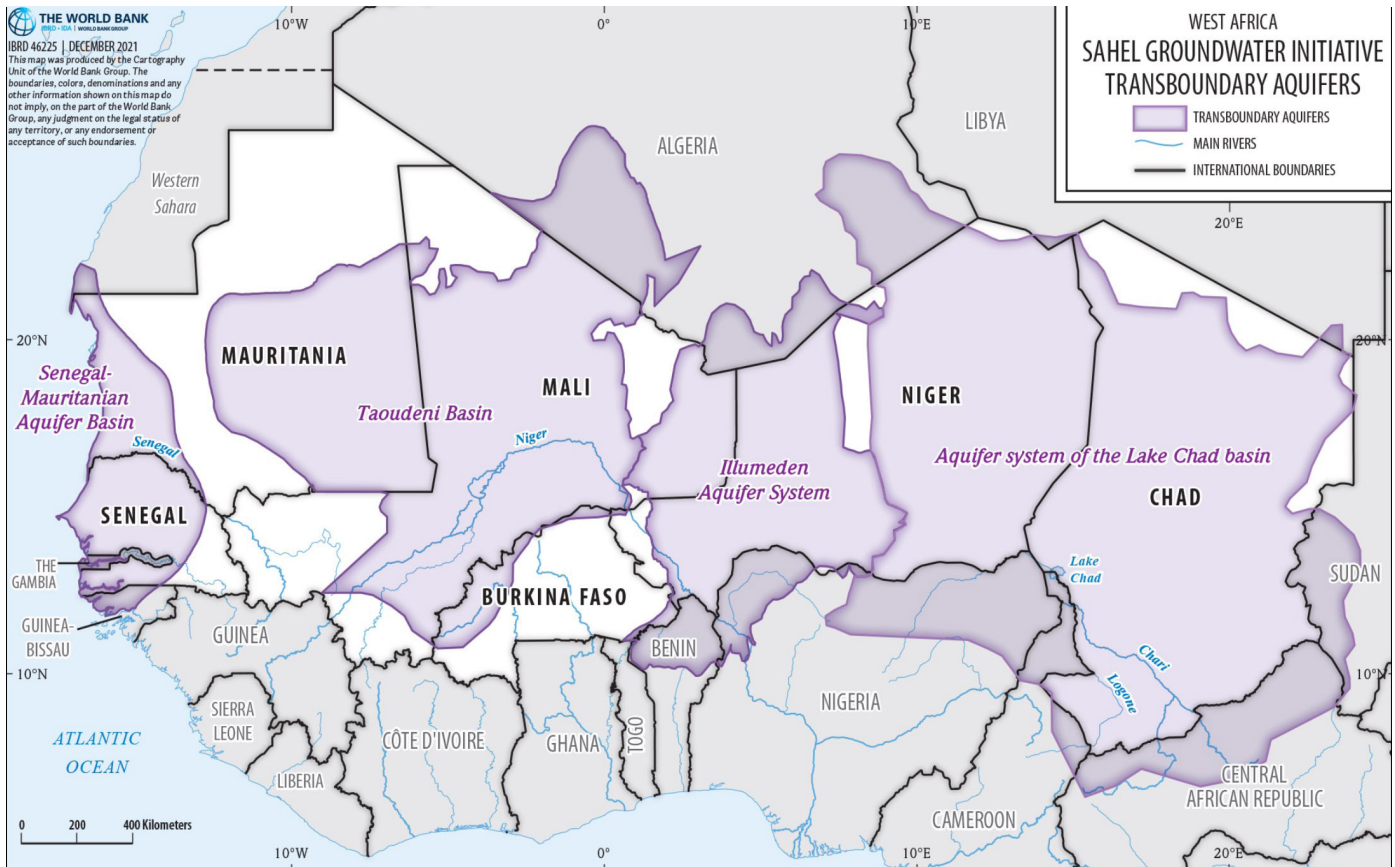
SMAB, the Taoudeni Basin, the Lullemeden Aquifer System, the aquifer system of the Lake Chad Basin, and the crystalline basement.

Following a gap analysis and typology on groundwater-dependent ecosystems (GDEs) in FY21, the technical assistance in FY22 highlighted the economic importance of these ecosystems and identified how groundwater resource management that considers GDEs can contribute to equitable and sustainable development. The GDE analytics are being extended to Sub-Saharan Africa and will be included in a World Bank groundwater flagship report under preparation.

Industrialization, mining activities, inadequate sanitation and solid waste management, or agriculture can negatively impact groundwater quality in the Sahel, where effluent treatment is insufficient. These activities can release chemical or microbiological contaminants that degrade groundwater quality (decreasing potable water availability), yet major uncertainties over the quality and quantity of groundwater make it challenging to determine where and to what extent groundwater can be used sustainably.

This pillar will also assess opportunities for protecting urban groundwater resources by measuring shallow groundwater contamination in select cities. The team collaborated with the Cotonou-based National Institute of Water, an African Center of Excellence that conducts groundwater research, on pilot studies in Bamako, Mali and Bobo-Dioulasso, Burkina Faso, which will establish a baseline for the quality of shallow urban groundwater.

Strengthening Sahelian groundwater expertise



Pillar 3 included a diagnostic of groundwater expertise in the Sahel, which also considered barriers to women’s access to advanced training in groundwater. The diagnostic identified research and academic cooperation mechanisms to train new groundwater experts, while supporting Sahelian groundwater experts to increase cooperation on transboundary aquifers. This component identified regional and national partners and champions for knowledge exchange and capacity building and supported local universities to develop potentially

transformative strategies to improve the quality of undergraduate training, retain graduates interested in groundwater studies, and create a common master’s degree program in hydrogeology.

Next Steps

Reports will be finalized and disseminated to Sahelian CMUs and stakeholders in the remaining months of this technical assistance, which will close in mid-FY23, and ultimately be incorporated into the

preparation of future investments in the region. Some results have already been integrated into the World Bank’s Regional Sahel Pastoralism Support Project (known by its French acronym PRAPS2) and to the starting SMAB technical cooperation. Other findings will soon be deployed in ongoing projects such as the pilots for improved farmer-led irrigation under the Sahel Irrigation Initiative Support (SIIP) project and will inform the next regional Water for Climate Resilience and Peace Project focusing on groundwater investments.

Water scarcity in the Western Sahel, impact of climate change, and need for sustainable management of groundwater resources at both regional and national levels, led to this technical assistance.

A View from the Field:

Training the next generation of groundwater specialists in the Sahel



©Jorge Trevino / CIWA - View of the Chari River from the LCBC building, February 2022

As climate change diminishes the availability of surface water in Africa, groundwater has emerged as a vital untapped resource. But, in the Sahel, a global hotspot for climate change and one of the poorest regions in the world, limited knowledge about groundwater resources hampers efforts to develop strategies to cope with water scarcity. Nor are there enough hydrogeologists trained in the sustainable management of this resource.

CIWA is playing a pivotal role by convening stakeholders around the goal of increasing the cadre of Sahelian groundwater specialists and improving their skill level. It supported a weeklong roundtable discussion in March 2022 in Nouakchott, Mauritania, which brought together academics responsible for training groundwater specialists in six countries to identify the main gaps in training and forge solutions.

The countries—Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal—made a potentially transformative decision to both improve the quality of undergraduate training to retain students interested in groundwater studies and to create a common master’s degree program in hydrogeology. Because many Sahelians pursuing careers in groundwater must attend universities abroad to obtain advanced degrees and may remain overseas to work, a homegrown master’s degree program could reverse that trend and build up regional expertise.

“This roundtable made it possible to deepen the discussions, share experiences from each country, fill in the gaps, and find solutions,” said Dr. Seynabou Cisse Faye, a senior hydrogeologist and associate professor who is responsible for hydrogeology training in the Department of Geology at the Cheikh Anta Diop University of Dakar in Senegal.

The challenge of increasing the number of women in the geology department drew Dr. Faye to the field of groundwater. “Geology was not a very attractive subject for women, and there was practically no enthusiasm for training women,” she recalls.

“I said to myself, ‘Why are there not enough women?’ That is what steered me into the field,” says Dr. Faye, whose academic research topics include the vulnerability and pollution of aquifer systems in urban, mining, and agricultural areas and the contribution of isotopic tools to the study of pollution. She eventually rose to become head of the geology department from 2017 to 2021 and now leads the master’s program in hydrogeology. She is also the scientific manager of the department’s hydrochemistry laboratory.

Dr. Faye saw first-hand how hard it has been to recruit students interested in becoming groundwater specialists at her university. “Our big problem right now is training,” she says.

Because of limited university resources, about five times as many students apply to the hydrogeology program as can be enrolled—far less than is necessary to meet the region’s groundwater resource management needs. And, as became evident at the roundtable, the quality of training opportunities across the Sahel is spotty, leaving some students unable to train in the field of earth sciences and thus acquire basic geology skills or obtain internships or jobs.

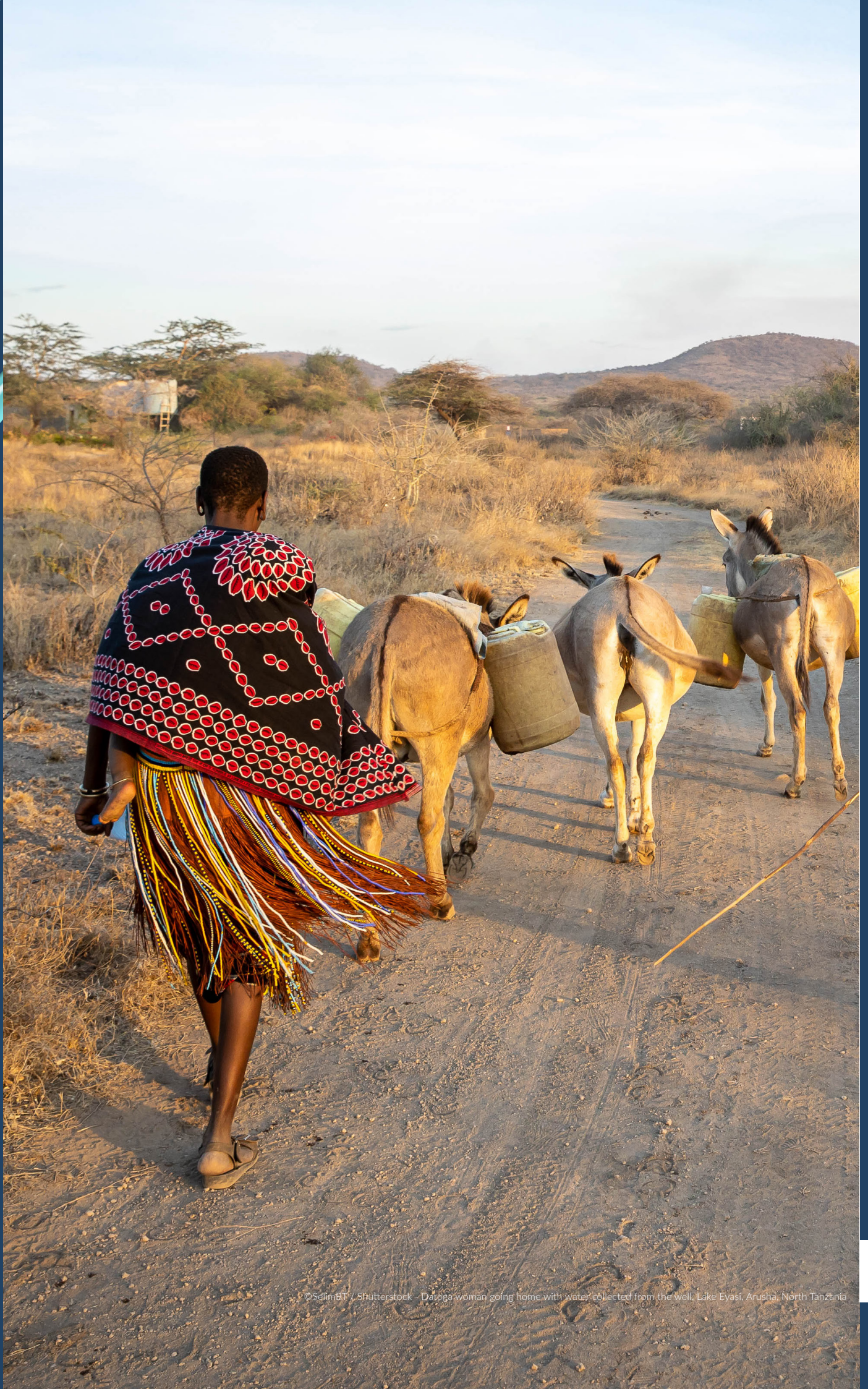
Exploring these shared challenges and opportunities across the six countries helped build trust and cooperation. “We share certain basins, the climate, socio-economic contexts, and the unavailability of water resources,” Dr. Faye says. “It was in our interest to pool our resources and create a unifying program” that will allow universities to exchange students and skills. . . which can be beneficial for all countries.”

She said that CIWA can continue playing “a decisive role in facilitating meetings between training institutions in the field of water resources in different countries, creating frameworks for reflection to improve knowledge, identifying shortcomings, and trying to find solutions together.”

Roundtable attendees were enthused about the proposed master’s degree program, expected to take three years to develop and implement, to tap into the region’s valuable groundwater resources. “It is an extraordinary idea,” she says. “It will be something great, really fantastic.”

HORN OF AFRICA

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The Horn of Africa is facing cascading impacts from the worst drought in four decades. CIWA worked to improve access to groundwater as the region's cornerstone of water security. It expanded the knowledge base on groundwater, strengthened the capacity of partners to manage and develop this valuable resource, and improved regional initiatives focused on building resilience. CIWA also supported Somalia in developing its vision and capacity for transboundary water resources management.

Horn of Africa Groundwater Initiative

Context

Groundwater represents the main source of water in the HoA, where 30 percent of the population lives on arid and semi-arid lands. The region faces prolonged and intense drought and conflict from the inequitable sharing of groundwater aquifers. The transboundary nature of groundwater aquifers in the HoA makes assessments and monitoring of water levels and quality particularly challenging.

To reduce the potential for conflicts over sharing groundwater resources, IGAD implemented the Horn of Africa Groundwater Initiative for its member countries of Djibouti, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda. Now in the process of closing, the initiative worked to strengthen the capacity of countries to manage and develop regional groundwater resources and to expand the knowledge base on transboundary groundwater resources. CIWA supported the feasibility study of the transboundary Merti Aquifer investment for the governments of Kenya and Somalia, which included (i) groundwater data collection and analysis, (ii) regional calibration of the Juba-Shebelle River Basin GeoSFM model,¹⁶ and (iii) hydro-diplomacy training.

Progress

The team held national validation workshops on knowledge management and capacity-building needs assessments in Djibouti, Ethiopia, Kenya, Sudan, Uganda, Somalia, and South Sudan in FY21.

This contributed to strengthening the region's groundwater knowledge base and identifying critical gaps to address future investments.

IGAD's Climate Prediction and Application Center (ICPAC) includes a regional hydrological modeling exercise that assesses surface and shallow groundwater potential and spatial and temporal variability and reliability, with a focus on the Juba-Shebelle River Basin GeoSFM model. The regional water resource information database developed by ICPAC contributed to the IGAD geonode¹⁷ (spatial web portal) and to IGAD's East Africa Hazards Watch.

The initiative also supported valuable opportunities for knowledge exchange and learning among the region's groundwater experts and practitioners. The theme of the 2nd IGAD Water Forum, conducted in January 2022 in Entebbe, Uganda, underscored the international community's focus on the unseen yet vital water

source, especially in arid and semi-arid areas.

Discussions highlighted the need for member states to prioritize groundwater management in policy development and budgets to gain visibility and attract investments and the importance of proper use of water given worsening climate change impacts. A regional study tour took place in 2022 to promote HoA collaboration and cooperation on transboundary aquifer management, which demonstrated the mechanisms for cooperation between South Africa and Botswana. The initiative also facilitated gender training at IGAD to strengthen project cycle mainstreaming approaches and identify short- and mid-term actions for gender capacity development.

The initiative supported the preparation of a study for the Merti Aquifer investment between Kenya and Somalia to complement current knowledge; established guidelines for groundwater exploration, management, and protection; and provided plans to develop water-related infrastructure. It also included a study for the associated

¹⁶ Geospatial Stream Flow Model (GeoSFM) is used for monitoring hydrologic conditions over wide areas and designed to use remotely-sensed meteorological data in areas with sparse data.
¹⁷ <https://geonode.igad.int/>

Environmental and Social Impact Assessments (ESIA). Following delays caused by the local security situation, COVID-19 impacts, and limitations of data availability, the study was completed as the project was closing at the end of FY22 after several validation workshops with Kenya and Somalia.

Next Steps

The initiative provided a valuable foundation and contributed lessons learned for CIWA's new technical assistance, Untapping Resilience: Groundwater Management and Learning in the Horn of Africa's Borderlands, and for the design and preparation of the World Bank's Horn of Africa Groundwater for Resilience (GW4R) project. A US\$385 million IDA-funded regional

effort approved in June 2022, GW4R will increase sustainable access to, and management of, groundwater in the region's borderlands.

This initiative laid a foundation for future collaboration among HoA countries and resulted in the development of a concept note to establish an IGAD Groundwater Information Center, which will be implemented by the HoA GW4R project. The center will enable enhanced sustainable groundwater use by making data and information readily available. This will feed into both regional and national planning, decision-making, and project implementation. Lessons emerging from the Merti Aquifer study will inform the project's implementation and scope of investments in transboundary areas.

Untapping Resilience: Groundwater Management and Learning in the Horn of Africa's Borderlands was launched in April 2022 to support the GW4R's regional learning agenda and subsequent institutional capacity-building objectives. The learning agenda will be crucial to provide institutions with knowledge and capacity on: (i) the role of groundwater in the HoA's regional integration; (ii) sustainable groundwater service delivery; and (iii) groundwater's role in addressing fragility and strengthening resilience in the borderlands. Core activities will include the collection of data emerging from the implementation of activities in participating countries through enhanced supervision and third-party monitoring.



© Amors photo/ Shutterstock - Water carriers are waiting to fill their water tank in Baidoa, Somalia

Somalia Transboundary Water Resources Management

Context

CIWA supported the government of Somalia in articulating its water resources development options for the Juba and Shebelle basins and structuring its transboundary agenda to pursue dialogue with neighboring countries Kenya and Ethiopia. The technical assistance, which ended in FY22, responded to the government of Somalia's request for capacity building in transboundary dialogue, negotiation, trust-building, and information exchange.

The assistance expanded to support water resources management and added new sub-activities including training for water-resources modeling, support for developing the National Water Resources Strategy (NWRS), and data development for stream flow modeling and Data Cube tools. This technical assistance helped lay the foundation for strategic water-sector planning and development of Somalia's vision and priorities for transboundary waters.

Progress

The technical assistance helped staff in Somalia's Ministry of Energy and Water Resources (MoEWR) learn about transboundary water management and hydrological and water resources modeling. Interaction with experts from CIWA and other global organizations at a Nairobi workshop in 2018 and two study tours for water resources staff to learn best practices (to Astana, Kazakhstan in October 2018 and Geneva, Switzerland in May 2019) helped shift mindsets away from

zero-sum competition over water sharing toward a broader view of cooperative benefit sharing.

COVID-19 travel restrictions prevented performing hydrologic simulations using the Hydrologic Resource Assessment Model, but trainees acquired knowledge and skills on hydrology, geographic information systems, and data management. The assistance, which included more advanced capacity building, policy dialogue, modeling, and hydro-meteorological data management, served as a foundation for future World Bank assistance.

Enhancing overall MoEWR operations and decision-making, while not an original objective, became a major, if unexpected, outcome. This resulted from the CIWA team providing timely, evidence-based responses to technical queries from the MoEWR on issues beyond transboundary water cooperation, including project management, event organization, and water service delivery.

The nature of some deliverables changed throughout implementation, as it became apparent that the conditions were not ripe for a recipient-executed activity or transboundary dialogue. While the technical assistance was intended to initiate dialogue between Somalia and neighboring upstream countries, Somalia's efforts to begin consultations were not reciprocated. As a result, transboundary engagement activities have not occurred, while the second and third deliverables (a summary report on transboundary engagement activities and draft terms of reference for

follow-up recipient-executed activities) were not produced. Instead, the CIWA team adjusted the deliverables to include a high-level assessment of options to produce water-related data and information and development of options for water resources monitoring and information management.

The first deliverable, "Somalia: 21st Century Data and Information Management," is feeding into the World Bank-executed support Somalia: The Economics of Water. Given data scarcity in Somalia, this output will lay the groundwork for a more comprehensive and thorough analysis of water resources in Somalia.

Somalia: The Economics of Water has particularly benefited from this deliverable's analysis of the Juba and Shebelle riverine areas. The Biyoole-II project has benefited from the capacity-building workshops on water resources data management and modeling, as the 12 trained hydrologists are now overseeing the identification of sites for the US\$42 million Bank project. These hydrologists are also the main technical experts tasked with preparing the proposed Biyoole-II project.

The second deliverable provided the MoEWR design options for a national program on water resources monitoring and information management. The third revised deliverable lays the groundwork for Somalia to make progress on water resources information as a key element for developing its national and regional transboundary water agendas.

Somalia's NWRS includes a gender component, which notably aims for the development of a water sector gender strategy and plan.

The technical assistance also delivered "Overview and Outcome of Five Water Resources Management Options," which is the first integrated food and water security assessment for Somalia.

Next Steps

The World Bank's ongoing water sector engagement in Somalia benefited from this technical

assistance in three main ways. First, its collection of data and information including on water risks and opportunities of the Juba and Shebelle rivers will inform future water sector analytics. Second, findings will shape and underpin the water section of the forthcoming World Bank Country Partnership Framework for Somalia. Finally, recommendations in the NWRS will influence future engagements and a potential project pipeline around service delivery, multipurpose infrastructure along the Shebelle and Juba rivers, and water monitoring. These engagements will

include plans to conduct training on hydrological and water resources modeling that were not completed because of Covid-19 travel restrictions.

The NWRS gives Somalia a framework to illustrate and discuss key sector issues and priorities with its development partners, including the World Bank, in the future. It also empowers Somali water experts to voice their opinions and priorities in a context where agenda-setting and implementation have typically been the prerogative of international agencies and NGOs.



©Michael Tsegaye/ UNICEF - Pastoralists travel to Harshim, Ethiopia, from neighboring towns and Somalia in search of water.

Strengthening Resilience in the Horn of Africa

Context

The Horn of Africa is highly susceptible to climate-related risks¹⁸ and concurrent shocks and stressors including conflict, food insecurity, and pest outbreaks. These conditions jeopardize growth and development potential stemming from the strong trade and relational bonds among groups and communities in HoA transboundary areas.

Given the multisectoral nature of these risks and crisis drivers, concerted efforts are needed to enhance the region's preparedness and response. This technical cooperation strengthened key stakeholders and improved the enabling environment for deepening integration efforts and facilitating identification of investments for enhancing resilience.

Building on three interconnected pillars (strengthening information for resilience, strengthening institutions and organizations for resilience, and strengthening the knowledge base for regional resilience investments), activities addressed key areas for the HoA to prepare for, and respond to, shocks.

Progress

Initially, the technical cooperation supported the preparation of products that defined the vision of a resilient HoA, explored potential regional investment opportunities, enhanced data exchange, and improved cooperation platforms. A stocktaking of the World Bank's past regional resilience initiatives

contributed to strengthening the knowledge base on resilience building, resulting in the report, "Invisible Bonds: Transboundary Resilience Building in the Horn of Africa."¹⁹ This work introduced a new conceptual framework for improving transboundary resilience (T-Res) for practitioners involved in the design and implementation of resilience-building projects.

Strengthening information for resilience

Pillar 1 of the grant focused on strengthening the information base for resilience through data (e.g., on the natural resource base, movement of people and animals, disease surveillance, and meteorological information) to inform policies, shared management of resources, and joint development planning.

This pillar focused on the unfolding desert locust upsurge as a real-time example of a complex, transboundary crisis that requires exceptional coordination and information sharing to successfully manage a response.

The impact of desert locusts has exacerbated the stress felt by vulnerable communities from droughts, floods, food insecurity, and conflict, increasing tensions over scarce water resources.

Understanding the interaction among these factors and the capacity of local and national institutions is pivotal to build resilience and ensure the sustainable management and use of natural resources.

The team produced a Rapid Qualitative Assessment of Desert

Locust Risk Management in the HoA to analyze the strengths and weaknesses of desert locust management systems at regional and national levels in Djibouti, Ethiopia, and Kenya.

The assessment used a risk management conceptual framework consisting of (i) monitoring and early-warning systems, (ii) vulnerability and impact assessments, and (iii) mitigation, preparedness, and response actions. This approach enabled the coordination of distinct phases of the disaster-risk management cycle. For example, monitoring and early warning (Pillar 1) enabled the timely deployment of mitigation, preparedness, and response actions (Pillar 3), which had been identified and designed based on the knowledge of natural and human processes analyzed in vulnerability and impact studies (Pillar 2).

The assessment created recommendations and an opportunity for deeper collaboration between IGAD and other partners, such as the Food and Agriculture Organization (FAO) and the Agence Française de Développement (AFD). The assessment and regional dialogue helped build agreement around a set of actions, several of which are being addressed by the World Bank Emergency Locust Response Program (ELRP) investment projects.

Strengthening institutions and organizations for resilience

Closely connected to Pillars 1 and 3, activities under the Pillar 2 focused on the identification and planning

18 HoA countries fall within the top 20 percent of those ranked as most vulnerable to climate change by the ND-GAIN Index. The index measures vulnerability to climate change and readiness to increase resilience.

19 https://www.ciwaprogram.org/wp-content/uploads/W22000_Invisible-Bonds_Transboundary-Resilience-in-HoA_Accessible.pdf

of four key knowledge products.

They include: (i) a diagnostic on the desert locust response, (ii) a Regional Groundwater Management Institutional Assessment, (iii) a synthesis report, “Strengthening Local Institutions for Resilience in the Horn of Africa,” and (iv) a Rapid Qualitative Assessment to Strengthen Drought Risk Management in Kenya.

The groundwater institutional assessment provides insights into the role of communities in managing the resource and challenges and opportunities around groundwater in resilience to climate change.

The synthesis report²⁰ presents a typology of stakeholders engaged in promoting resilience and includes guidance for World Bank task teams to implement resilience-building projects.

Strengthening the knowledge base for regional resilience investments

Pillar 3 focused on improving the knowledge base to guide regional investment identification. The activity conducted two virtual workshops for facilitating HoA country dialogues that addressed policies and coordination measures to deepen regional integration around resilience. The team also identified the best ways to incentivize long-term operation and maintenance of rural groundwater boreholes, which resulted in the development of a performance-based grant manual.

The Rapid Qualitative Assessment to Strengthen Drought Risk Management provides insights and recommendations for Kenya’s drought intervention activities. The assessment uses the three pillars of

the Integrated Drought Management Program²¹ to inform Kenya’s drought interventions under the World Bank’s new GW4R project.

Next Steps

This technical cooperation closed in FY22 with strong progress throughout its three pillars. It will be important to test the results and conclusions developed thus far, which will require continued outreach (through workshops, working groups, and knowledge fora). Further analytical insights will be derived from engaging with task teams across the World Bank, among other development partners and practitioners, to integrate resilience-building aspects and ensure a robust monitoring and evaluation approach.



©Angelica Ospina Parada - Lodwar rural water supply scheme, Turkana County, Kenya.

20 The publication builds on the analytical approach identified in the ‘Invisible Bonds’ report and other World Bank analytical work including the reports, ‘Poverty and Vulnerability in the Ethiopian Lowlands’ and ‘From Isolation to Integration: The Borderlands of the Horn of Africa.’
21 <https://www.droughtmanagement.info/pillars/>

SOUTHERN AFRICA

Southern Africa Drought Resilience Initiative

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Sustainable Groundwater Management
in SADC Member States—Phase II

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©Wynand Lys/ Qasqash! - Aerial view of the Okavango River, Shakawe, Botswana

Prolonged drought conditions in Southern Africa are fueling food and water insecurity, poverty, and economic fragility. In response, CIWA addressed the region's significant challenges managing its increasingly important groundwater resources. It worked to build resilience to widespread impacts of droughts by addressing cross-border drought risks, promoting cooperative management of shared waters, and facilitating cooperation efforts around cross-border sustainable management of transboundary aquifers.

Southern Africa Drought Resilience Initiative

Context

Drought is the most costly and deadly climate shock in Southern Africa, affecting livelihoods, economies, and ecosystems.²² Most of the 16 member states of the Southern Africa Development Community (SADC) suffer from varying degrees of water insecurity because of more frequent and severe droughts. CIWA created the Southern Africa Drought Resilience Initiative (SADRI) technical cooperation, now in its third year, to build resilience to the multi-sectoral impacts of drought and address climate change more broadly.

SADRI's vision is of a drought-resilient region in which governments, institutions, and households can withstand and thrive amid climate change and related economic shocks. The initiative advances a regional integration agenda and priorities (such as the SADC Regional Strategic Action Plan) to address drought risks while promoting cooperative management of shared natural resources. SADRI is embedded in the three key elements of the Integrated Drought Risk

Management framework: (i) drought-monitoring and early-warning systems, (ii) drought vulnerability and risk assessments, and (iii) drought preparedness, mitigation, and response. These components form a comprehensive approach to drought-risk management across the WEFE nexus.

SADRI provides technical assistance and analytics along three pillars—cities, energy systems, and livelihoods and food security, with an umbrella pillar for the overall initiative. The Cities Pillar contributes to the effective use of National Hydromet and Drought Risk management systems by developing technical expertise and strengthening early-warning systems and planning through the standardization of tools to assess vulnerabilities and create opportunities to enhance resilience.²³ The Energy Pillar assesses efforts to create more resilient energy systems, fills critical analytical gaps in the WEFE nexus, and improves the decision-making of hydropower dam operators, while the Livelihoods and Food Security Pillar address

opportunities for climate-smart agriculture and livelihoods diversification. This pillar also leverages the governance structure of Trans-Frontier Conservation Areas (TFCAs), which approaches biodiversity conservation from a regional perspective.

Progress

Umbrella Pillar

The initiative completed national and regional level Stocktaking and Needs Assessments of member country drought resilience. This exercise, which followed a virtual regional workshop in 2021 (with over 90 participants from 30 institutions), produced 16 Drought Resilience Country Profiles and a Regional Profile²⁴ that captured commonalities and key opportunities and guided consultation processes.²⁵ These outputs will be instrumental in identifying potential regional drought-risk management investments.

The team also developed a Knowledge Hub on Drought

²² vis-Reddy, C.L. and Vincent, K. 2017: Climate Risk and Vulnerability: A Handbook for Southern Africa (2nd Ed), CSIR, Pretoria, South Africa & International disasters database (<http://www.emdat.be>)

²³ The Cities Pillar strengthens early-warning systems and planning through the standardization of tools to assess vulnerabilities and build opportunities for enhancing drought resilience. Relevant mitigation measures include guidance notes, emergency response plans, and planning for and/or applying adaptive water management approaches. This pillar is intended to inform the following Bank projects: Emergency Water Security and Efficiency; Eswatini WSSAP; Integrated Land and Water Management; and South Africa Urban RAS II.

²⁴ All available at <https://www.ciwaprogram.org/southern-africa/>

²⁵ By developing drought resilience profiles for each of the 16 SADC member states and a comprehensive regional profile that captures commonalities and key opportunities, SADRI provides information that supports the identification of regional drought risk management investment opportunities. The drought resilience profiles deepened the understanding of the state of drought-risk management by identifying (i) major stakeholders, (ii) policy and institutional frameworks, and (iii) the availability and operability of key systems for improving drought resilience.

Resilience²⁶ in 2021 to disseminate the initiative's key learnings, which supported knowledge exchange and fostered stakeholder dialogue.

The World Food Program (WFP) integrated the output into its Regional Vulnerability Assessment and Analysis Program (RVAA).²⁷

Cities Pillar

This pillar contributed to a draft toolkit, planned for release in FY23, to advance proactive drought-risk management and opportunities to enhance cities' drought resilience.

The deliverables included drafts of a City Drought Resilience Toolkit (targeting World Bank task teams) and Regional Notes that provide a conceptual framework, guidelines, methodologies, tools, and data sources to support client engagement, complement ongoing initiatives and projects, and enable new ones. The team is working closely with country task teams to test the documents' applicability by developing rapid analyses and case studies, which will include Dar es Salaam, Tanzania; Toliara, Madagascar; Blantyre, Malawi; Lilongwe, Malawi; Bulawayo, Zimbabwe; Gaborone, Botswana; Windhoek, Namibia; and Cape Town, South Africa. The regional guidance notes will target clients and other external stakeholders, drawing on African and global case studies on improving drought-monitoring and early-warning systems, policy and institutional reform, planning, and investments. They will provide practical recommendations for assessing, preparing for, and coping with the impacts of urban droughts.

Energy Pillar

The Energy Pillar focused on knowledge products that support efforts to secure resilient energy systems for hydropower operators and power utilities. The pillar fills critical analytical gaps in the WEFE nexus, improves operational decision-making for dam operators, and supports the strategic priorities of

SADC's Southern Africa Power Pool (SAPP), which comprises national electric power companies.²⁸ Legal considerations required activities to focus on understanding the behavior of SAPP under stress through modeling of drought impacts. The objective is to help the Bank and clients understand SAPP's resilience to drought and key areas for further investment.

Work on a SAPP Drought Sensitivity and Resilience Assessment has begun in collaboration with the SAPP Coordination Center.

The study has three phases: (i) an assessment of drought impacts on SAPP, (ii) an examination of power flows and bottlenecks to resilience through trade, and (iii) identification of priority investments for increasing resilience. SADRI will finance the first phase, but SADRI support for subsequent phases will depend on the timing and availability of funds.

Livelihoods and Food Security Pillar

One activity under this pillar, operationalizing drought-resilient contingency mechanisms within investment operations, was completed in FY22.

Two other activities will be completed in FY23: (i) developing agri-food value chain solutions to manage and finance drought-risk mitigation and (ii) filling analytical and knowledge gaps on water usage and options for livelihoods diversification in the Great Limpopo TFCA spanning Mozambique, South Africa, and Zimbabwe. **The development of agri-food value chain solutions for drought risks entails conducting studies to support the Eastern Cape Provincial Government in identifying potential areas for irrigation development to support inclusive horticulture and improve resilience to droughts.** These areas are based on land use suitability, water availability assessments, financial analysis, and beneficiary identification. The study is considering three options: small estates, small riparian farms, and homesteads.²⁹

The team also conducted a watershed management scoping study to identify other upstream investments to protect the watershed.

The study identified the need for investment in (i) pasture management and related livestock management, (ii) green-preneurs (vetiver grass) and multi-purpose garden establishment, (iii) land restoration, (iv) use of invasive species for biomass value chain development, and (v) community afforestation and agroforestry.

Building on the scoping study, the team is conducting a detailed assessment (to be completed in FY23) of watershed management investment needs in the Umzimvubu watershed (part of the Drakensburg-Maloti TFCA) for a potential public-private investment project.

With the International Finance Corporation (IFC), the team is also identifying possible private sector partners for inclusive investment in the beef sector to help expand pasture management improvement initiatives.

The pillar is providing technical support to the Great Limpopo Transfrontier Conservation Area (GLTFCA) to better understand water governance and use of community-level drought mitigation measures. The target community is the Pafuri-Sengwe Node on the borders of Mozambique, South Africa, and Zimbabwe. The target water systems for analysis are the Limpopo River, Mwenezi/Nuanetsi River, Luvuvhu River, and Buby River. Activities include (i) determining the extent of water availability in groundwater aquifers, wetlands, and river systems; (ii) assessing the current demand and usage of these waters, especially among communities in the Pafuri-Sengwe Node; (iii) evaluating governance practices for managing the waters; and (iv) identifying, developing, and recommending near- and medium-term actions for water management that can build community drought resilience.

²⁶ <https://geowb.maps.arcgis.com/apps/MapJournal/index.html?appid=cb0fc8aa450f4b35a018f7e0115867be>.

²⁷ <https://rvaaatlas.sadc.int/>

²⁸ SADRI's pillar on securing more resilient energy systems also responds to the EU Commission's engagement on increasing synergies between water and energy diplomacy.

²⁹ A concept for the development of rainwater harvesting for the homesteads was developed as a basis for a pilot potentially to be funded by Eastern Cape Provincial Government, and potential investors were identified for the development of out-grower arrangements between small estates and homesteads/small farms in cooperation with IFC.



©Katie Archibald-Woodward - Heron and river, Ngorongoro crater, Tanzania

Other activities include (i) mapping and characterizing wetlands within the Pafuri-Sengwe Node; (ii) undertaking a hydro-census for the Limpopo, Luvuvhu, Mwenezi/Nuanetsi, and Buby River systems to identify predominant water use practices; (iii) characterizing existing water resources management and governance practices; and (iv) identifying potential investment opportunities.

Next Steps

With activities completed or nearing completion, SADRI seeks

to leverage new opportunities to partner with the SADC Secretariat and other regional and national partners and development institutions to realize a common vision of a drought-resilient region.

The SADRI-generated knowledge and analytical work will catalyze and inform regional and national investments. To that end, the SADRI team is working to identify and leverage complementarities with individual country lending efforts and link with broader World Bank climate resilience programs.

This initiative has been extended to April 2023 to support collaboration and partnership building with the SADC Secretariat and other development actors through a joint workshop and output dissemination event (tentatively planned for October 2022). This will stimulate collaboration and shared learning among member states and stakeholders to improve the technical knowledge base on drought resilience and position SADC to champion future country and regional drought preparedness and management upgrades.

Sustainable Groundwater Management in SADC Member States—Phase II

Context

SADC member states have worked to reduce risks and promote cooperative management of their 30 transboundary aquifers to ensure their long-term sustainability and potential to enhance livelihoods. CIWA facilitates cooperation efforts for sustainable transboundary groundwater management on shared aquifers by engaging with five RBOs: Orange-Senqu Commission (ORASECOM), Limpopo River Commission (LIMCOM), Cuvellia River Commission (CUVECOM), Zambezi Watercourse Commission (ZAMCOM), and Okavango River Commission (OKACOM) and will engage with the new INKO MAPUTO (for the Inkomati and Maputo River basins), covering Eswatini, Mozambique, and South Africa.³⁰

In the first phase of CIWA support to SADC-GMI (closed in FY21), the team completed Transboundary Diagnostic Analyses (TDAs), with a joint strategic action program (SAP) implemented to support project sub-grants to several countries.³¹ Activities began with studies to better understand the potential of transboundary aquifer use and management, followed by the TDA and SAP processes. These contributed to the creation of common frameworks for identifying and formulating strategies, programs,

and investments in response to transboundary challenges (including GDEs and biodiversity management) and the identification of water security hotspots and water supply options. Initiatives promoting coordinated use of groundwater and surface water were also jointly implemented with the five RBOs.

This assistance is pivoting to further strengthening hydrogeological capacity in regional institutions and unifying disparate information systems for managing groundwater data. The assistance will also support implementation of groundwater management action plans and regulations.

Progress

CIWA is supporting this phase with a US\$9 million grant³² to build capacity and strengthen institutions. Five National Focal Groups (NFGs) were established in Phase I, and eight will be created in Phase II. Once the three remaining NGFs are established through Global Environment Facility (GEF) co-financing, all 16 member states will have focal groups, which play a key role in groundwater management and project implementation. In FY22, the SADC Groundwater Information Portal (SADC-GIP)³³ was updated by linking it to national, RBO, and other stakeholder groundwater databases,

with the objective of making SADC-GIP a one-stop platform for groundwater data (now including biodiversity data). SADC-GIP serves national and local authorities and other stakeholders who are involved in groundwater management, development, and research.

The work undertaken on GDEs and biodiversity³⁴ in transboundary aquifer (TBA) contexts primarily focused on the Khakhea-Bray TBA (shared between Botswana and South Africa). The studies focused on understanding and demonstrating the role of groundwater in sustaining below- and above-ground aquatic ecosystems (e.g., wetlands, rivers, and springs) and anthropogenic impacts³⁵ on groundwater. The studies aimed to establish thresholds for minimum groundwater levels that can be used to prevent negative impacts on ecosystems.

CIWA prioritized GESI in Phase II because greater inclusion in water resources management can produce substantial economic, social, environmental, and financial benefits and foster effective implementation of groundwater management interventions. CIWA supported the development of a GESI Mainstreaming Strategy for SADC-GMI to be implemented by 2025. The project also aimed to

30 SADC-GMI participated in the launch of INKO MAPUTO in November 2021 and is now negotiating an MOU for a formal collaboration.

31 These included Malawi, Botswana, Zimbabwe, Tanzania, Mozambique, Zambia, Namibia, Eswatini, and Lesotho.

32 In addition to CIWA funds, a US\$5 million grant was obtained from the Global Environment Facility (GEF) and a US\$500,000 grant from GFDRR.

33 <https://sadc-gip.org/>

34 This activity began in Phase 1 and was advanced in FY22 jointly by SADC-GMI and a team of independent research scientists from the Aquatic Systems Research Group (ASRG), University of the Free State's Institute for Groundwater Studies (IGS), the University of Mpumalanga, and the University of Venda.

35 Impacts examined included those arising from abstraction of groundwater and reduced groundwater recharge.

promote the role of women and vulnerable populations as principal educators and leaders of home- and community-based water and sanitation practices. Preliminary results from recent research show that biodiversity loss and degraded ecosystems can reinforce gender inequalities and worsen poverty by significantly increasing the time spent by women and girls on unpaid family care and domestic work (e.g., cooking and collecting water), which reduces time for education and economic activities.³⁶

Given the indispensable link between biodiversity and community socio-economic activities, GDEs are critical to maintaining biodiversity and supporting livelihoods (by providing water, cooler habitat, and food sources). These findings also highlighted the need for research to develop integrated management interventions for groundwater, biodiversity, and ecosystems that are more sustainable and address the needs and priorities of stakeholders.

Next Steps

In the next year, SADC-GMI plans to reevaluate its existing capacity-building plan to ensure its alignment with emerging regional priorities on groundwater management. It will continue to support its Young

Professionals program to ensure more participation of women and introduce them to academic programs at regional universities. SADC-GMI will evaluate the impact of the five original NFGs and capture lessons from their operations, develop management plans for identified hotspot GDEs, and prioritize action steps.

The SADC-GIP will be updated to include data on climate change and associated resilience building. SADC-GMI plans to develop climate adaptation measures for addressing increasingly variable and scarce water resources with support from the International Fund for Agriculture Development (IFAD) for enhancement of water and food security.³⁷ This work will also include promoting the sustainable use of transboundary groundwater resources and increasing their availability for agricultural productivity and food security to build climate resilience. Target TBAs include Ramotswa Aquifer (between Botswana and South Africa), Limpopo Basin Aquifer (between Mozambique, South Africa, and Zimbabwe), Sand and Gravel Aquifer (between Malawi and Zambia), and Tulikaroo Aquifer (between Botswana, South Africa, and Zimbabwe).

This assistance will support LIMCOM, ZAMCOM, and ORASECOM to establish Groundwater Committees,

as was done with other RBOs in the first phase, and create the first Groundwater Strategy for LIMCOM. SADC-GMI is working with RBOs to extend the work to include other TBAs.

The sub-grant manual will be updated to incorporate GESI, the Bank's Environmental and Social Framework, COVID-19 safety, and innovation. A comprehensive stakeholder engagement study is underway to assist in the implementation of the GESI Mainstreaming Strategy in the Khakhea-Bray TBA, including identifying relevant stakeholder categories and their respective priorities. Following the study, stakeholder engagement in the development of management plans will also be undertaken.

Further innovative pilot groundwater infrastructure solutions that can be scaled up through investments will be developed.³⁸ Solutions will be designed within the national and regional context to implement innovation and synergies with other national programs and maximize impact. Member states will identify and leverage resources for infrastructure investments addressing identified priorities in the TDAs and SAPs at national and transboundary levels.

The CIWA-supported GESI Mainstreaming Strategy for SADC-GMI aimed to promote the role of women and vulnerable populations as principal educators and leaders of home- and community-based water and sanitation practices.

³⁶ Several research papers were presented at regional conferences and published by research teams. Additional dissemination and management of the research results are slated for the SADC Groundwater Conference scheduled in November 2022.

³⁷ CIWA supported proposal and concept note preparation and stakeholder consultation workshops to begin this work.

³⁸ Future interventions may include complementing the expansion of national/regional groundwater monitoring networks and linking them with systems such as the HYCOS program, which monitors surface water, promotes conjunctive surface and groundwater management through managed aquifer recharge schemes, and/or establishes WEFE nexus initiatives that use groundwater information.



© Victor Vespquez / CWA - Study tour for the Groundwater Initiative project in Botswana

CROSS- CUTTING THEMES

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Water Data Revolution: Closing the data gap for transboundary water in Africa

CIWA supported the Water Data Revolution (WDR): Closing the Data Gap for Transboundary Water in Africa—a Bank-executed technical assistance to improve the capacity to collect, store, and use satellite-based (remotely sensed) data for evidence-based decision-making. This initiative helps governments address constraints to cooperative water management by putting RS-derived data tools into the hands of managers at Africa’s basin-wide organizations.

Improving the management of transboundary water resources and increasing resilience to hydrological extremes require understanding water resource dynamics at both basin and national levels. WDR takes a user-driven approach to identifying common needs

and connects end-users with appropriate solutions, including RS tools, satellite imagery, and custom data products.

The initiative assessed the data use and capacity of 15 RBOs and three regional organizations spanning 37 countries. The assessment revealed the data gaps and priority data needs that could be mitigated through the adoption of RS-based technology, data products, and analytical tools. Organizations prioritized expanding their capacities to acquire, manage, and store free or low-cost RS datasets and use RS data tools and applications for drought and flood analyses. The assessment also provided insights into organizational challenges in adopting digital data platforms,

including financial constraints, lack of technical capacity, and staffing shortages.

In the next year, this technical assistance will use the assessment outcomes to provide capacity-building opportunities aligned to the needs and goals of participating organizations. Expected outcomes include improving their use of RS data products and analytical tools while also accounting for constraints in using digital data platforms. WDR will help organizations adopt low-cost technologies for data collection, storage, and analysis while promoting sustained use through workshops and capacity-building sessions.



Gender and Social Inclusion

In FY22, CIWA ramped up its work on GESI, with the overall strategy guided by CIWA's GESI Framework.³⁹ The framework represents a transformative approach that recognizes that countering deep-seated patriarchal norms that exclude women requires a shift from one-off, short-term interventions toward a harmonized and integrated approach that is sustained throughout the life of the project and beyond.

CIWA delivered on its commitment to build capacity on gender by conducting a two-part training for World Bank staff on how to implement GESI in transboundary WRM projects. The training has since been expanded to a World Bank transboundary water program in Central Asia. In the next year, trainings will include partner organizations at regional and national levels.

CIWA produced two Learning Notes and plans to develop more in FY23. The first⁴⁰ captures critical findings and recommendations from experiences providing GESI technical assistance at the preliminary phase of CIWA's projects. The second⁴¹ involved collaboration with Nile Basin colleagues in documenting NCORE's successes and challenges in applying a gender lens within the complex basin environment. Some of these findings are expected to appear in a forthcoming book on transboundary water governance.

With CIWA's increasing focus on groundwater management, additional lessons learned have been assembled and shared through communications including blogs⁴² and a presentation at an international groundwater conference, "Groundwater: Key

to the Sustainable Development Goals."⁴³ The lessons reflect the experience of applying the GESI Framework to the Sahel Groundwater Initiative by both mainstreaming GESI and developing a stand-alone component that seeks to recruit more women hydrogeologists.

CIWA is excited about its recent launch of the Male Champions Initiative that it developed with SIWI. Building on the transformative approach, the initiative will create a cadre of male champions in transboundary water programs who are willing to promote opportunities for women to become leaders and decision-makers in their organizations. In the next year, CIWA plans to pilot the initiative at local, national, and institutional levels.



©Simone D. McCourie / World Bank. Land husbandry activity on a steep hill, Nyabihu District, Rwanda

39 <https://www.ciwaprogram.org/wp-content/uploads/CIWA-Gender-and-Social-Inclusion-Framework-1-1.pdf>

40 https://www.ciwaprogram.org/wp-content/uploads/CIWA_GESI_LEARNING_NOTE_1_March2022.pdf

41 <https://www.ciwaprogram.org/wp-content/uploads/CIWA-NBI-Gender-learning-Note.pdf>

42 <https://www.ciwaprogram.org/blog/forging-ahead-towards-a-more-gender-equal-world-in-transboundary-water-management-in-sub-saharan-africa/>

43 <http://gw-sdg2022.fr/index.php/en/>

A View from the Field:

The Nile Basin's Pioneering Approach to GESI



The Nile Basin is one of the most challenging places in the world to advance gender equality. Patriarchal beliefs, including stereotypes that women can't understand technical issues, and male resistance to sharing power often give women little voice in decision-making processes about water resources, even though water is critical to their livelihoods and families.

Women need to work together “to make decisions about how much water is needed, where to get the water, and how to organize themselves to extract water from a riverbed,” says Donald Kasongi, former secretary-general and now chair of NBD's Tanzanian chapter, which has been working with CIWA to transform gender relations in water resources management across the basin.

CIWA's GESI Framework recognizes that most approaches to addressing gender inequality, such as counting the number of women at meetings to demonstrate results, are inadequate to make lasting progress toward equality. Its GESI approach is about shifting mindsets and taking a holistic approach by addressing gender norms and roles; power and decision-making; access to, and control over, resources; and institutional barriers to women's full participation.

Kasongi is doing just that in the Nile Basin.

While working on gender issues for 15 years, Kasongi says, he finds himself “digging deeper and deeper to understand social norms. It's not about how many women are in the room. It's about making sure that women are agents of themselves.”

He emphasizes that a one-size-fits-all approach to GESI won't work in such a diverse region. While some eastern and central Nile countries are more open to reconsidering patriarchal norms and values, in countries where women are seen as property of the male heads of households, a different approach is required.

In those countries, NBD, with support from CIWA, works with traditional male leaders to try to instill in them an appreciation of women's contributions to bringing water home to their families and the importance of including them in decisions about managing community water resources. These leaders in turn talk with male heads of households to encourage the same understanding and acceptance of women's water-related roles and the need to involve them in water resource decision-making. NBD also engages influential women from colleges, universities, and the news media to help shift community norms and attitudes.

“They are on the frontlines of their communities and know what's possible, what's not possible, and what are acceptable strategies,” Kasongi says.



© NBD Women Training on Green Jobs and enterprise, Uganda, August 2021

Communications

CIWA takes a multimedia and multichannel approach to its external communications, which are designed to raise awareness about the importance of sustainable management and development of water resources in Africa and CIWA's impact. The communications team captures voices from the field through its 'Across the Pond' podcast series,⁴⁴ blogs on CIWA's activities featuring water champions and experts,⁴⁵ and videos about the interplay between water and climate change, FCV, disaster risk management, GESI, and natural resources protection. CIWA also keeps stakeholders informed through its quarterly CIWA Bulletin,⁴⁶ showcasing editorial and creative content and news about CIWA's activities and impact.

The CIWA communications team nurtured its relationships with Africa's transboundary organizations through the Water Information and Communications in Africa (WICA) community of practice (CoP) it formed in the previous fiscal year. The CoP has built trust and cooperation and enabled cross-promotion of partners' social media and website content.

CIWA enhanced and reorganized its website (ciwaprogram.org and ciwaprogram.org/fr). Enhancements include a new section on the program's focus areas, enriched regional content, an expanded resources section, and a section dedicated to CIWA's 10th anniversary, which includes a special

report, "CIWA at 10: A Decade of Building Trust and Improving Water Security in Sub-Saharan Africa."⁴⁴

CIWA launched its presence on Twitter—@CIWAProgram—in September 2021, building its audience with engaging tweets in both English and French and executing four social media campaigns to raise awareness about CIWA's work. This included leveraging social media buzz around UN recognition days and water sector events and promoting CIWA's own milestones.

Campaigns included:

CIWA's 10-Year Anniversary Campaign—February 2022

To mark CIWA's anniversary, the communications team created social media postcards with quotes about CIWA and engaging video vignettes featuring CIWA partners, donors, managers, and World Bank leaders that generated campaign awareness and reached 3.6 million Twitter followers, thanks to partners and supporters sharing our materials far and wide. [Blog](#)

International Women's Day and Gender Week—March 2022

This campaign spotlighted women water experts at the World Bank and partner organizations through engaging and informative videos, positioning women as leaders and skilled professionals. The campaign, which also highlighted CIWA's GESI Framework and its new learning

notes, reached more than one million Twitter followers. [Blog](#)

Sahel Groundwater Initiative Roundtable—February-March 2022

CIWA live tweeted and promoted video interviews with attendees at the roundtable on training the next generation of groundwater specialists in Nouakchott, Mauritania, which was co-sponsored by CIWA and the World Bank and brought together Sahelian university representatives who decided to create a joint graduate degree program in hydrogeology. [Video 1](#) [Video 2](#)

World Water Day and 9th World Water Forum—March 20-26

CIWA participated in the three-day Instagram campaign during World Water Day that featured World Bank projects from multiple regions, global practices, and partners highlighting the economic case for investing in water, the role of water in fighting COVID-19 and improving health outcomes, and water's potential to help end poverty and promote shared prosperity. CIWA staff also participated in the 9th World Water Forum in Dakar, Senegal, joining political and economic decision-makers and representatives from multilateral institutions, academia, civil society, and the private sector. The World Bank booth and the African Network of Basin Organizations (ANBO) pavilion, co-financed by CIWA, featured CIWA's 2021 Annual Report and "CIWA at 10." CIWA staff live-tweeted during the forum, including about CIWA-hosted events.

44 <https://www.ciwaprogram.org/category/podcast/>

45 <https://www.ciwaprogram.org/category/blog/>

46 <https://www.ciwaprogram.org/bulletins/>

WATER CONVENTION

OIEau International Office for Water

OTCA Organización del Tratado de Cooperación Amazónica

UN environment programme

REPUBLIC OF SLOVENIA MINISTRY OF FOREIGN AFFAIRS

ZAMCOM

ORASECOM

9th World Water Forum DAKAR 2021

Cap-Net

UNDP

FINNISH WATER WAY WATER COOPERATION AND PEACE

RAOBI ANBO

OKACOM

nexus

LIMCOM

WORLD WATER COUNCIL

OMVG

POLE EAU DE DAKAR

Global Water Partnership

Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra Swiss Agency for Development and Cooperation SDC

Republique du Sénégal

Transboundary Water Pavilion

21-25 March 2022



© Andate Jägerskog/CIWA - One of the panel (here with NBD's Chairman, Ms Nyiramana) during the World Water Week, Dakar, March 2022

CIWA's Mid-Term External Evaluation

CIWA commissioned a Mid-Term Review (MTR) to build on findings and lessons from its 2015 MTR. The earlier evaluation found CIWA to be highly relevant and fit-for purpose, while also noting challenges and making recommendations to improve performance, pace of implementation, resources, and engagement of development partners. The new MTR reviewed CIWA's implementation and performance, level of ambition, and results in the context of the scale of needs and demands on the ground. The conclusions will guide CIWA's programmatic adjustments to maximize impact until the program's scheduled close in 2026.

The scope of the evaluation includes all three types of CIWA engagements: (i) sustained support in priority basins, (ii) high-impact/strategic engagements for advancing cooperation outside priority basins, and (iii) knowledge generation and sharing. The MTR also covered CIWA's strategic directions including FCV, biodiversity, and resilience and thematic work including GESI, communications, and data. The evaluation included a review of key documentation, data and other input from 112 stakeholders, and a broad online survey. The evaluation team produced six case studies on CIWA's work in the Nile River Basin, the Niger River Basin, the Zambezi River Basin, the Lake Chad Basin, Southern Africa, and the HoA.

MTR Conclusions

Following the first MTR, CIWA leadership made important changes to the program strategically,

geographically, and operationally including delivering its work in close alignment with donors and expanding its approach from working in priority basins to focusing on regions of interest to engage with a broader range of partners and achieve greater impact. To guide its work, CIWA developed three pillars known as the three "Is," which include improving access to information; strengthening institutions; and identifying, preparing, and mobilizing sustainable investments. The three Is framework of engagement mechanisms underpin the current Theory of Change, which captures many of CIWA's strengths in developing regional cooperation.

The current MTR noted the above progress and identified many programmatic strengths including that CIWA is highly relevant to donors and countries and aligns with World Bank priorities. As the only World Bank Trust Fund focusing on transboundary waters in Africa, CIWA has a clear value-add and is complementary to other Bank projects and programs.

The evaluation found that CIWA is effective, contributes to institutional and policy development and investments, is efficient and flexible, and meets Advisory Committee objectives (such as supporting decentralized WRM development in FCV countries, prioritizing biodiversity and gender equality, providing sustained assistance to regional water organizations). CIWA has also improved its visibility both within the World Bank and among external stakeholders, which has been critical for financial resource mobilization, project planning, and

implementation purposes. The evaluation also identified areas of program design, structure, implementation, and learning that may merit attention to strengthen impact, discussed below.

Overall, the MTR found that while CIWA has made evident strides, there is room for improvement, both in its programmatic work and especially in financial resource mobilization. The MTR concluded that despite strong alignment with development partners' programs and active engagement with stakeholders, only two of the Advisory Committee institutions have renewed contributions to the program in the past five years. Two key recommendations are to develop greater synergies between CIWA interventions and donor development programs and to improve resource mobilization, particularly to address growing FCV-related challenges. It was noted that, with over 97% of CIWA funds committed to existing projects, it will be difficult for CIWA to utilize the lessons from the MTR without new funds. Some recommendations include: (i) further **strengthening CIWA's culture of learning, (ii) diversifying stakeholders (regional, national, civil society, and community institutions) with whom CIWA works, and (iii) better aligning CIWA's Theory of Change with its Results Framework**. In FY23, CIWA and key stakeholders will meet to review the recommendations and develop a strategy for advancing progress in the years ahead, which will focus on the new vision for the CIWA portfolio and resource mobilization.



EASTERN NILE TECHNICAL REGIONAL OFFICE

ENTRO

NILE BASIN INITIATIVE

©Anders Jørgensen / CIWA - CIWA Team visiting the Eastern Nile Technical Regional Office (ENTRO) in Addis Ababa, Ethiopia, April 2022

Looking Ahead

As Africa's challenges mount amid the global economic downturn, climate change intensifies, and countries become increasingly fragile, CIWA's work in the year ahead is more important than ever.

We will continue our efforts to equip countries beset by these challenges with the knowledge, capacity, tools, and financial resources needed to build back better from economic fragility and the pandemic and to increase resilience to coming climate, food, energy, and health shocks.

Cooperation over joint infrastructure and other development projects is essential for countries not only to share financial costs and benefits during difficult economic times but also to mitigate the drivers of conflict and minimize the potential for tension over how to manage and develop shared waters.

To that end, CIWA plans to create a framework for our engagement in fragile and conflict-affected countries, which will benefit from work conducted for this year's joint report with SIPRI on water cooperation in the HoA.

We will have a laser focus on addressing resilience because of the mutually reinforcing negative impacts from the volatile mix of conflict and climate change, among other stressors. We are

increasingly taking a regional water security approach that assesses and then works to mitigate the drivers of conflict, which include food and water insecurity, internal displacement, and climate change.

We plan to deepen our work in biodiversity conservation following our evaluation of the linkages between CIWA's programmatic activities and biodiversity conservation approaches. This may include determining whether to pursue, for example, investments in nature-based solutions to manage water resources or in the protection and sustainable management of water towers, which produce large volumes of runoff to sustain downstream lowland areas.

We will take our GESI work to the next level by launching several pilot projects for our emerging Male Champions Initiative developed with SIWI. The initiative aims to establish a corps of male water experts who promote opportunities for women to become decision-makers and leaders in transboundary organizations.

We will double down on our focus on groundwater, which, if managed sustainably, can be a vital solution for adapting to climate change and FCV challenges. We are exploring options for management of an aquifer basin in Senegal and

Mauritania and examining potential new opportunities such as a hybrid groundwater project in Niger.

We are also considering a transboundary project for investments in both small- and large-scale water storage in Senegal and preparing the next phase of our work in the Lake Chad Basin to elevate the voices of community members, modeled after our successful project for stakeholder engagement in the Nile Basin.

Overall, we are developing a pipeline of projects—both new ones and scale-up of existing work—to address the enormous challenges in sub-Saharan Africa. However, these projects cannot proceed without new financing. With all the US\$135 million previously raised from our donors fully committed to existing work, it is critical that we secure additional financing for the next several years.

As you have read in this report, the water-related needs of the continent are immense. CIWA has the experience and expertise to meet them, but our vision of a water-secure Africa cannot be realized without the resources required to rise to the challenge. The people of sub-Saharan Africa are counting on us to deliver.

We will continue our efforts to equip countries with the knowledge, capacity, tools, and financial resources needed to build back better from economic fragility and the pandemic and to increase resilience to coming climate, food, energy, and health shocks.



© Arne Hoel/ World Bank - Women by the White Nile (Morada), Khartoum, Sudan

COOPERATION IN INTERNATIONAL WATERS IN AFRICA



The Cooperation in International Waters in Africa (CIWA) was established in 2011 and represents a partnership between the World Bank, its African partners and the governments of Denmark, the European Commission, Norway, Sweden, the Netherlands, and the United Kingdom. CIWA supports riparian governments in Sub-Saharan Africa to unlock the potential for sustainable and inclusive growth, climate resilience, and poverty reduction by addressing constraints to cooperative management and development of international waters.

www.ciwaprogram.org

www.ciwaprogram.org/fr

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MINISTRY OF FOREIGN AFFAIRS
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