

ANNUAL REPORT

Cooperation in
International
Waters in Africa

2023

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Waters in Africa

Credit list

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Woman fishing on Lake Chad. ©Naomi Frerotte / UNOCHA

Abbreviations

AC	Advisory Committee
BETF	Bank-executed Trust Fund
BUPUSA	Buzi, Pungwe, and Save
BWP	Basin-wide Program
CBA	Community-based Association
CCDR	Country Climate and Development Report
CIWA	Cooperation in International Waters in Africa
CSA	Climate-smart agriculture
DRC	Democratic Republic of the Congo
DRDAR	Department of Rural Development and Agrarian Reform
DSRAS	Drought Sensitivity and Resilience Assessment
ECPG	Eastern Cape Provincial Government
ENTRO	Eastern Nile Technical Regional Office
FCV	Fragility, conflict, and violence
FY	Fiscal Year
GEF	Global Environment Facility
GESI	Gender Equality and Social Inclusion
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse gas
GIS	Geographic Information System
GLTFCA	Great Limpopo Transfrontier Conservation Area
GP	Global practice
GPG	Global public good

GW4R	Groundwater for Resilience
HoA	Horn of Africa
HoA-GWI	Horn of Africa Groundwater Initiative
HPP	Hydropower plant
IDA	International Development Association
IFC	International Finance Corporation
IGAD	Intergovernmental Authority on Development
KBA	Key biodiversity area
KGGTF	Korean Green Growth Trust Fund
LCBC	Lake Chad Basin Commission
LIMCOM	Limpopo Watercourse Commission
LVBC	Lake Victoria Basin Commission
MIS	Management Information System
MSIOA	Multi-Sector Investment Opportunities Analysis
MWRI	Ministry of Water Resources and Irrigation
NBA	Niger Basin Authority
NBD	Nile Basin Discourse
NB-DAS	Nile Basin Data and Analytic Services
NBI	Nile Basin Initiative
NBS	Nature-based solutions
Nile-SEC	Nile Basin Initiative Secretariat
NCCR	Nile Cooperation for Climate Resilience
NELSAP-CU	Nile Equatorial Lakes Subsidiary Action Program Coordination Unit
NBS	Nature-based solutions
NFG	National Focal Group
PDO	Program Development Objective

PIU	Project Implementation Unit
PMU	Program Management Unit
PROLAC	Lake Chad Region Recovery and Development Project
RCRP	Regional Climate Resilience Program
REC	Regional Economic Commission
RBO	River basin organization
RETF	Recipient-executed Trust Fund
RS	Remotely-sensed data
RWH	Homestead rainwater harvesting
RWSS	Rural water supply and sanitation
SADC	Southern African Development Community
SADC-GMI	SADC Groundwater Management Institute
SADC-GIP	SADC Groundwater Information Portal
SADC-GWM	SADC Sustainable Groundwater Management

SADRI	Southern Africa Drought Resilience Initiative
SAPP-CC	Southern Africa Power Pool Coordination Center
SGR	Strategic Grain Reserve
SIWI	Stockholm International Water Initiative
SMAB	Senegalo-Mauritanian Aquifer Basin
TAC	Technical Advisory Committee
TBA	Transboundary aquifer
UDRMF	Urban Drought Risk Management Framework
UNDP	United Nations Development Program
WDR	Water Data Revolution
WEFE	Water-energy-food-environment
WRM	Water resources management
WSA	Water Security Assessment
ZAMCOM	Zambezi Watercourse Commission
ZRA	Zambezi River Authority

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Foreword

Twenty-six million people in the Horn of Africa are facing extreme hunger from a devastating and lengthy drought.

In Southern Africa, water levels at the Kariba Dam, which generates hydroelectric power for millions of people in Zambia and Zimbabwe, have dropped to record lows from a lack of rainfall, forcing repeated electricity cutoffs.

South Sudan is still recovering from catastrophic flooding from 2018 to 2021, and it ranks seventh in the world for flood risk.

Whether suffering from too much or too little water—and some countries sometimes simultaneously suffer from both—water insecurity and climate change impacts continue to rise in Sub-Saharan Africa and are triggering cross-border tensions. Food insecurity is also rising and, when coupled with fragility or violence, can cause humanitarian crises, as in the Lake Chad Basin, where terrorism is destroying livelihoods and agricultural crops and causing people to flee their homes in search of food, water, and livelihood opportunities. CIWA's work to improve Africa's water security holds the key to countries' climate adaptation and resilience, access to water and food, and peace and stability. In the fiscal year (FY) that ended June 2023, CIWA helped clients sharing transboundary waters in Sub-Saharan Africa mitigate the worst effects of cascading crises.

CIWA's contributions came as the World Bank strategically moves toward greater emphasis on sustainability, resilience to shocks, and inclusion to achieve its mission, which will enable the World Bank to better deliver global public goods (GPGs).

For more than 10 years, CIWA has been addressing challenges that cross borders and helping national and regional institutions come together for the common good. CIWA's projects, analyses, knowledge generation, and investments to achieve the regional public good of cooperation on transboundary waters and create resilience to shocks are fully aligned with the World Bank's enhanced mission to foster sustainable, resilient, and inclusive development to end extreme poverty and boost shared prosperity.^{1,2} Results from CIWA grants have directly influenced the design and feasibility of large (>US\$350 million) regional International Development Association (IDA)-funded projects that take CIWA's work to the next phase of World Bank investment mobilization and strategic climate-resilient water security improvements (such as influencing the Groundwater for Resilience [GW4R] program and Regional Climate Resilience Program [RCRP]). Annex 2 shows all the operations influenced by CIWA grants, which include many countries that suffer from profound issues of fragility, conflict, and violence (FCV).



Fulani woman returning from the well with a jar filled with water, village of Wuro Neema, Arusha, Tanzania. ©IRD

Regional integration has been a political and economic priority on the continent since the dawn of independence from colonial rule. The need for integration in the context of shared waters is abundantly clear.

For example, if South Sudan drains its wetlands to save water, there will be less evapotranspiration and likely less rain in Ethiopia, affecting surface water of the Blue Nile and the livelihoods and economies that depend on it.

The World Bank's regional integration and cooperation strategy of 2018 states that "in the midst of continuing global uncertainty and prospects for modest growth in Africa, greater regional integration remains an untapped driver of growth." The same is true today.

¹ <https://www.worldbank.org/en/news/statement/2023/01/13/world-bank-group-statement-on-evolution-roadmap>

² <https://www.ciwaprogram.org/blog/water-knows-no-borders-transboundary-cooperation-is-key-to-water-security-and-avoiding-conflict/>

To that end, CIWA supported key stakeholders on transboundary water resources management from river basin organizations (RBOs) to meet in Kampala, Uganda in May 2023. They committed to regional integration by strengthening collaboration mechanisms and linkages between RBOs, leveraging the financial and technical resources of development partners through transboundary cooperation arrangements, and improving data and information exchange.

Specific CIWA projects also promote integration, such as the Nile Cooperation for Climate Resilience (NCCR), which supports regional coordination on dam safety policies and flood early-warning systems in the Nile Basin. Untapping Resilience in the Horn of Africa (HoA) is increasing knowledge and capacity about the role of groundwater in regional water integration.

Despite having the least depleted natural water storage capacity, Africa has insufficient storage in the face of a changing climate. CIWA has worked to increase water storage and security to drive economic growth, contribute to climate change resilience, and enhance food and water security.

Integrating NBSs into green-gray infrastructure is key to unlocking investments and maximizing benefits.³ The future of water security for many people will likely depend on optimizing and finding the best balance of all possible solutions.

CIWA laid the groundwork for its stepped-up focus on groundwater storage under the Sahel Groundwater Initiative, which informed the ongoing preparation of the new \$300 million Development, Resilience, and Valuation of Water for West Africa project, and provided technical assistance to the Regional Working Group created for transboundary management of the Senegalo-Mauritanian Aquifer Basin (SMAB).

Anders Jägerskog
CIWA Program Manager

CIWA also strengthened the capacity of governments to manage and ensure the safety of existing water storage resources such as dams, including in the Nile Basin.

Because transboundary cooperation is significantly more challenging in countries facing FCV challenges, CIWA was engaged in four high-profile FCV-affected regions—the Horn of Africa, West and Central Sahel, Lake Chad, and the Great Lakes. CIWA supported governments and regional institutions there to address some of their most complex challenges, including the need to improve water security.

As the report, *Transboundary Waters: A Retrospective of the World Bank's Experience and Forward Look*, says, "In fragile contexts and those with legacies of significant tensions over natural resources, transboundary water cooperation can act as an important approach to de-escalate tensions, promote stability, and build resilience to shocks that might otherwise act as a trigger for conflict."

CIWA developed an FCV Framework to guide its work, which has four objectives—ensuring that its projects do not cause or exacerbate conflict, contributing to peacebuilding and development, generating knowledge, and facilitating reporting and communication.

The world's biodiversity is under threat. Rich, abundant biodiversity provides important socio-economic benefits, often in poor rural areas, contributing to job creation, poverty alleviation, and inclusive growth. Rivers, wetlands, and water towers are crucial ecological infrastructure for water and food security and economic development.

CIWA is exploring ways to better align its programming with biodiversity conservation goals, including identifying opportunities at the intersection of transboundary water management and freshwater biodiversity conservation. It conducted a biodiversity assessment and is developing a Biodiversity Framework to guide its work.

It also launched an innovative Male Champion Forum to recruit men to support the empowerment of women in water resources management.

Following last year's external mid-term evaluation report, CIWA has revised the Results Framework to more explicitly track results on biodiversity and gender equality and social inclusion (GESI) and to better align with its Theory of Change (Annex 2).

This year we said good-bye to two stellar practice managers in the Water Group, Yogita Mumssen and Catherine Tovey, who have moved on to other important roles at the World Bank. And we welcome Fatouma Toure Ibrahima, Anna Cestari, and Francis Ghesquiere who are joining Soma Ghosh Moulik as practice managers for CIWA.

Ai-Ju Huang
CIWA Deputy Program Manager

Introduction

Water is vital for life. It helps maintain health, grow food, produce electricity, protect jobs, and alleviate poverty. For these reasons, the World Bank supports countries to address their water challenges as a key element of its strategy to achieve its goals of ending poverty and building shared prosperity on a livable planet.

In line with World Bank objectives, CIWA and its development partners support Sub-Saharan African governments, regional institutions, civil society, and other partners to unlock the potential for sustainable, climate-resilient growth through cooperative water resources management and development.

CIWA's transboundary and multi-basin approach in Africa makes it unique in the development field.

Ninety percent of Africa's surface water is found in 63 transboundary river basins, and hundreds of millions of Africans depend on these basins and their lakes, rivers, and streams—and on their groundwater—to farm their fields, catch fish, and sustain life.

CIWA's work to safeguard, manage, and develop water resources in Sub-Saharan Africa is essential to people's lives, livelihoods, communities, and countries. CIWA strives to do this by advancing three pillars.

First, it generates and facilitates shared information—to understand risks, make better decisions, and monitor compliance, which allows knowledge to be exchanged among diverse RBOs, civil society organizations (CSOs), national governments, and other stakeholders.

Second, CIWA develops and strengthens institutions to build trust, coordinate planning, and manage shared resources, empowering countries with the tools to better manage resources and advance high-priority infrastructure investments, which is CIWA's third pillar.

CIWA advances these pillars by helping countries and organizations improve the quality and accessibility of information available for decision making; demonstrating how joint actions can increase benefits and reduce risks; supporting actions that strengthen regional institutions to provide a platform for riparian states to collaborate, share information, and act jointly; enabling governments to bring a wide range of stakeholders to the table so that development solutions reflect the needs of the people living in each basin, including impoverished people and marginalized groups; and facilitating actions to advance the quality of regional investments and promote adoption of a benefit- and risk-sharing approach.

These multiple entry points ensure that cooperation leads to sustainable growth and economic development in ways that improve the lives of the more than 500 million people living in Sub-Saharan Africa's transboundary basins.

Alignment with evolving global priorities

CIWA is well placed to contribute to the World Bank's growing ambitions for scaled-up action and impact to reverse the last three years of erosion of economic growth, poverty reduction, and human development stemming from the COVID-19 pandemic and for ameliorating multiple crises such as climate change, conflicts, and health crises.

In early 2023, the World Bank Boards of Executive Directors presented an Evolution Roadmap to help the institution better address the scale of global public goods challenges such as poverty, inequality, and cross-border threats—including climate change, pandemics, and FCV—which all affect the WBG's ability to achieve its mission.

Threats to prosperity are increasingly originating from global challenges, with cross-border effects and consequences that stretch far into the future. Emissions of greenhouse gasses (GHGs) have increased beyond sustainable levels, causing lower agricultural productivity, food insecurity, declines in biodiversity, tree-cover loss, and shrinking renewable water resources—all of which are hitting women and poor and vulnerable people the hardest.

Tackling cross-border challenges, especially climate change and FCV, will require the involvement of all countries, regardless of income level.

Preventing, preparing, and responding to crises will also require identifying and mitigating risks and developing resilience to shocks that worsen poverty and shared prosperity.

A focus on fragility and conflict

CIWA's work to strengthen institutions and knowledge about water resources and spur infrastructure investments is especially important in countries beset by FCV.

The people of Sudan suffer from armed conflict, leading to internal displacement and an exodus of refugees into neighboring countries. Ethiopia is facing a humanitarian crisis from multiple causes, including hostilities in the northern Tigray region during most of 2022, a weakened economy, and a prolonged drought affecting 30 million people that is also plaguing the rest of the Horn of Africa. Violence committed primarily by nonstate actors has inflicted tremendous harm on people living in the Sahel region's Lake Chad Basin.

Managing and sustainably developing transboundary waters is significantly more challenging in FCV settings. FCV can impede poverty eradication efforts, worsen environmental degradation, weaken resilience, and have an especially deleterious impact on women and other vulnerable groups. Diminishing access to water also can increase tensions and cause migration. But, if well managed, shared waters can drive peace, prosperity, and security.

Because of this, CIWA has prioritized scaling-up engagements in FCV settings. CIWA worked in 10 of 19 countries in Sub-Saharan Africa classified by the World Bank as affected by FCV in FY23.⁴ CIWA developed a framework to guide its FCV-related projects and technical assistance and enhance its effectiveness in these countries.

The framework has three components—identifying the drivers of fragility that impact water cooperation, developing mitigation measures based on the fragility drivers, and contributing to peacebuilding and development. It will be tested and refined in the next FY in several CIWA-funded engagements.

CIWA is increasingly undertaking conflict-sensitive programming, including adopting an integrated “problem-shed” approach in challenging places like the Sahel. A problem-shed is a spatial unit where issues and actors unite to take collective action because of proximity and shared tangible interests, which has a higher chance of improving water security than traditional water resources management.

CIWA’s technical assistance, Untapping Resilience: Groundwater Management and Learning in the HoA’s Borderlands, and the complementary World Bank GW4R program in the Horn of Africa borderlands are strengthening the ability of the Intergovernmental Authority on Development (IGAD), a regional economic commission (REC), and communities to cope with, and adapt to, climate shocks. The challenge for the borderlands is the harsh weather and terrain and incidences of violence. These regions are mostly inhabited by agro-pastoralists whose survival depends on a combination of nomadic livestock-keeping and subsistence farming. Mobility is central to their livelihoods, and the nomadic lifestyle has been a source of conflict over scarce resources (e.g., water and rangelands).

The Sahel Groundwater Initiative is similarly contributing to unlocking groundwater potential in the regions of Western Africa that are affected by FCV. Across the Nile Basin, NCCR is supporting enhanced drought and flood forecasting to mitigate climate risks in fragile environments.

Strengthening resilience to climate shocks

From droughts to floods to increasingly variable rainfall patterns, climate change continued its relentless march across Sub-Saharan Africa, wreaking havoc on access to water and livelihoods. With a rapidly growing population in the Sahel, for example, water availability is expected to decrease in the region by up to 70 percent by 2100.

Climate change poses a major threat to poverty reduction and other long-term development goals.

To support the alignment of development and climate objectives, the World Bank has launched the Country Climate and Development Report (CCDR),⁵ a key diagnostic tool to help governments, private sector investors, citizens, and development partners prioritize the most impactful actions to reduce GHGs and boost resilience and adaptation while delivering on broader development objectives.

In FY23, CIWA contributed to the creation of a CCDR for the Sahel region, which estimated that climate shocks could force as many as 13.5 million more Sahelians into poverty by 2050 if urgent climate adaptation measures are not taken.

CCDRs can be used for regional policies by providing a comprehensive analysis of climate impacts, offering actionable policy recommendations, facilitating a whole-of-government approach, and identifying economic opportunities for private sector investment. While CCDRs focus on national rather than regional climate issues, once the climate and development diagnostics are completed for each country in a region in CIWA’s portfolio, they will collectively give a deeper understanding of the regional issues.

NCCR, working with the Nile Basin Initiative (NBI), Nile Basin Discourse (NBD), and Lake Victoria Basin Commission (LVBC), is improving flood and drought resilience in the region. It is building and enhancing the robustness of early-warning systems for droughts and riverine and flash floods, developing gender-sensitive early-warning dissemination strategies and awareness programs, creating a flood management investment roadmap, and conducting capacity building for national governments.

The Southern Africa Drought Resilience Initiative (SADRI), which closed at the end of this FY, advanced an integrated multi-sector and multi-level approach to regional drought resilience in 16 Member States of the Southern African Development Community (SADC).

SADRI worked with countries, cities, and SADC to adopt a unified approach to drought risk assessment under three sectoral pillars—cities, energy systems, and livelihoods and food security—along with a crosscutting “umbrella” pillar.

CIWA continued to emphasize the importance of the hidden resource of groundwater to help countries and river basins cope with diminishing surface water and to boost water security, reduce poverty, and mitigate climate shocks. Projects such as the Sahel Groundwater Initiative and Untapping Resilience are generating knowledge and helping improve the management and use of groundwater.

Increasing attention to biodiversity conservation

The world’s biodiversity has been diminishing at an alarming rate—tens of thousands of animal and plant species have vanished because of human actions such as large-scale agriculture, overexploitation of natural resources, and climate change.

Half of the world’s ecosystems are threatened by biodiversity loss. Wetlands and river ecosystems are most at risk.

Traditionally, the World Bank has considered key biodiversity areas (KBAs) in the context of risk management as part of its Environmental and Social Framework safeguards to avoid causing harm. Current threats and the global biodiversity agenda demand more proactive and comprehensive actions to protect biodiversity and communities dependent on KBAs. Only about half of KBAs are protected in some form, leaving many vulnerable and without the financial resources necessary for their preservation.

⁴ <https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonized-list-of-fragile-situations>

⁵ <https://www.worldbank.org/en/publication/country-climate-development-reports>

The recently agreed Global Biodiversity Framework at the United Nations Biodiversity Conference (COP15) sets ambitious targets, including the conservation of 30 percent of land and sea areas; restoration of forests, landscapes, and seascapes; and the implementation of nature-based solutions (NBS) that benefit biodiversity. To achieve these targets and help people and nature, countries need to generate nature-positive finance.

CIWA is strengthening alignment of its programming with biodiversity conservation goals, including identifying opportunities at the intersection of transboundary water management and freshwater biodiversity conservation.

It conducted a biodiversity assessment, which found both direct and indirect benefits from its work. Key direct benefits include facilitating integrated and 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.

Key indirect benefits include strengthening RBOs and national water management agencies, supporting CSOs to facilitate evidence-based decision making, developing platforms to share information, and supporting improved rural livelihoods to reduce unsustainable natural resource exploitation practices.

In response to biodiversity challenges, CIWA is developing a framework to guide its biodiversity conservation work in the years to come.

Structure of this report



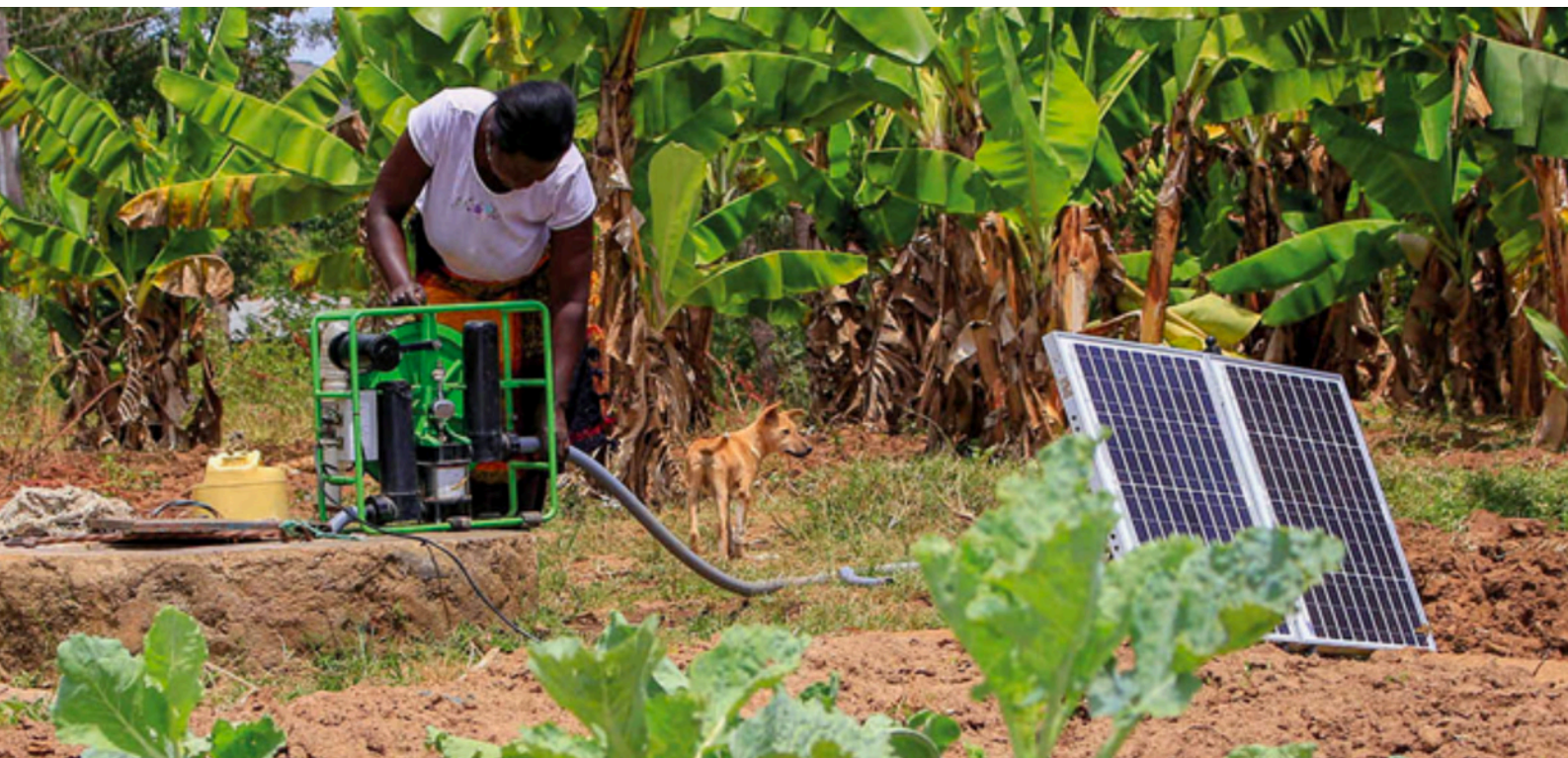
The report features regional sections that provide deeper dives into each of CIWA's grants. Results are focused on outcomes from FY23, with previous years' accomplishments described for context as needed. The report provides whole-of-project narratives and results when CIWA closed a project in this FY.



The report then presents CIWA's progress on cross-cutting themes including Water Data Revolution, GESI, and communications. In Looking Ahead, it describes how the current trajectories in CIWA's portfolio are expected to be carried forward in the next fiscal year. At the end of the report are profiles of people with whom CIWA or its grantees work in the field to provide a more personal look at CIWA's impact.



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.



Farmer using a solar irrigation pump equipped with a sensor. ©Futurepump

CIWA'S IMPACT*

People who benefit from investments influenced by CIWA:

97.46 MILLION PEOPLE

(from both mobilized and potential investments)



US\$17 billion in

INVESTMENTS

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

\$6.34 billion

Value of **mobilized** investments influenced by CIWA

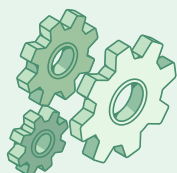


\$11.04 billion

Value of **potential** investments influenced by CIWA

To build trust, coordinate planning, and manage shared resources

20 Transboundary **INSTITUTIONS**

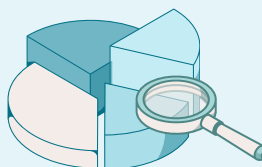


supported with CIWA technical assistance and financing

INFORMATION

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



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

CIWA IN FY23: Snapshot



Sustained support*

- Nile Basin
- Lake Chad Basin

Strategic Support

- West & Central Africa
 - SMAB Aquifer
- Southern Africa
 - SADC
- Horn of Africa
 - IGAD

*CIWA intends to provide sustained (reliable) support to four priority basins identified early according to Operational Guidelines—Nile River, Niger River, Zambezi River, and Lake Chad basins; however, this is conditional on both resources and basin demand. Currently only the Nile and Lake Chad basins are receiving sustained support.

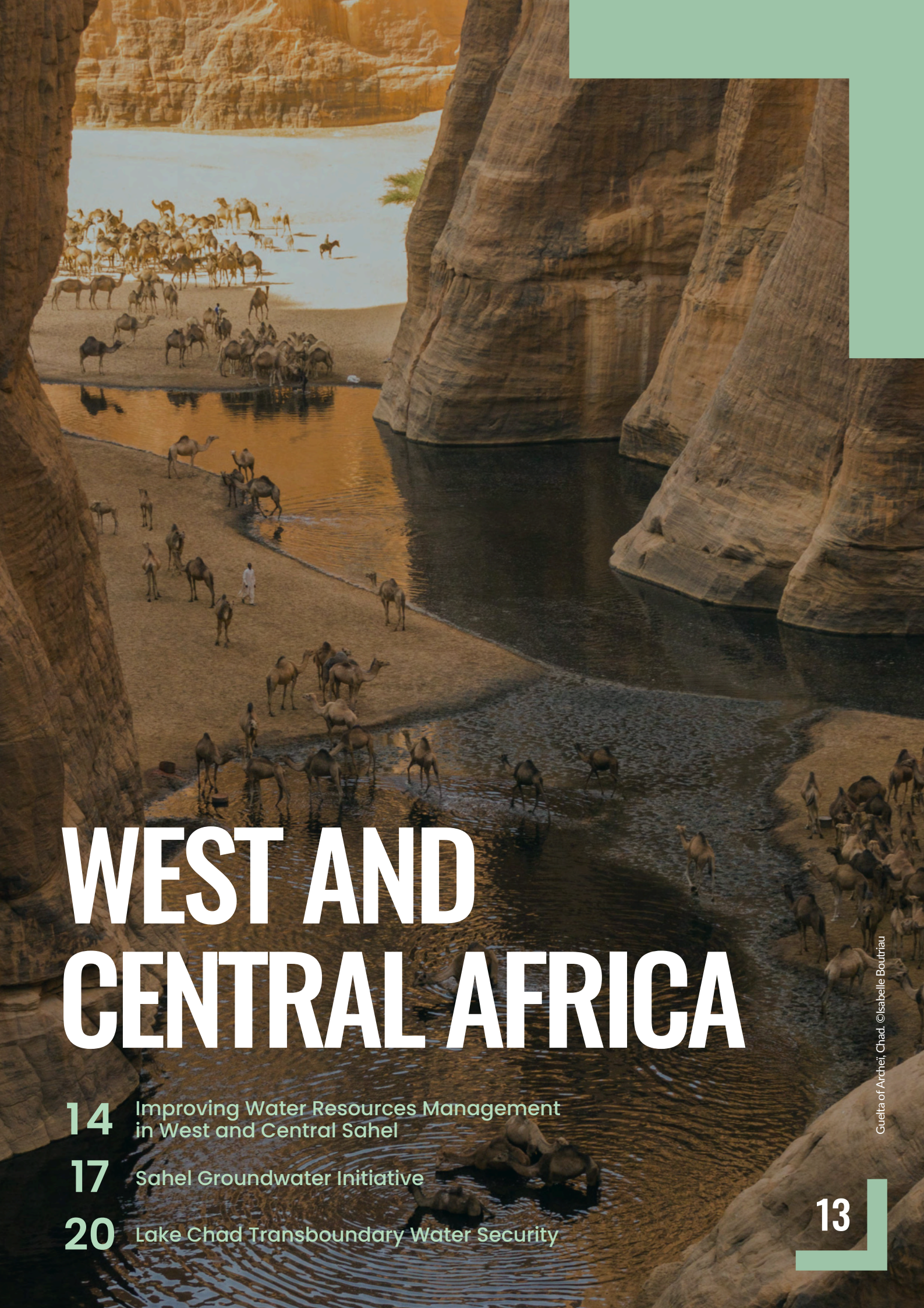
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WEST AND CENTRAL AFRICA

- 14** Improving Water Resources Management in West and Central Sahel
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- 20** Lake Chad Transboundary Water Security

West & Central Africa

The West and Central Africa region faces increasing climate change impacts, including prolonged drought and unpredictable rainy seasons. The Sahel 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, and CIWA is working to ensure the equitable participation of women in water resources decision making. CIWA also is improving water resources management by identifying investments and policy actions, addressing knowledge and capacity gaps, and emphasizing the sustainable management and development of groundwater resources to improve water security.

Improving Water Resources Management in West and Central Sahel

Context

West and Central Africa is the world's poorest region, with more than 40 percent of people in 22 countries living below the international poverty line of \$1.90 per day.⁶ The region includes about 20 transboundary basins, some of which are among the largest on the continent (e.g., Senegal, Niger, Volta, and Gambia river basins and Lake Chad). A quarter of West and Central African countries are experiencing FCV, with hotspots in the inner delta in Mali, western Niger, and large parts of Burkina Faso. Increasing pressure on water resources is a source of local agitation and cross-border tensions, leading to social and political instability, conflict, and displacement. As these pressures rise, the risks will also intensify, creating even more urgency for enhanced cooperation in the development and management of shared water resources.

The Improving Water Resources Management in West and Central Sahel technical assistance identifies pragmatic investments and policy actions that address critical knowledge and capacity gaps. The CIWA-supported initiative began in January 2020 with an initial allocation of \$US1.9 million for approximately three years (through February 2023) and has been extended for two years with additional financing. The objective is to contribute to improved water resources management through selected engagements in the Sahel by (i) identifying pragmatic investments and policy actions that can be supported by future operations and (ii) addressing critical knowledge and capacity gaps through “fit-for-purpose” Water Resources Management (WRM) assessments and technical assistance. The following is a summary of work during the first phase.

Progress

CIWA initiated seven engagements following client and Country Management Unit consultations in 2020. These include three country-level engagements (Burkina Faso, Cote d'Ivoire, and Ghana), a retrospective assessment of the World Bank's engagements on transboundary waters in the region, and three regional thematic activities on: i) strengthening regional water security for greater resilience in the G5 Sahel, ii) operationalizing small-scale storage in the Sahel, and iii) identifying partners for CSO dialogue. CIWA's initiative also supported broader demand-driven analytics on key themes (e.g., water-focused modeling for CCDRs in the G5 Sahel⁷ and Ghana) and a water security assessment in Nigeria.

Burkina Faso—Mobilizing water resources for development (2020)

The policy note prepared in FY21, “Burkina Faso—Mobilizing Water Resources Policy Note,” has served as the basis for discussions between the World Bank and the government of Burkina Faso on potential approaches for addressing major water security challenges. The policy note informed the Performance and Learning Review of the Country Partnership Framework and the new IDA-financed Burkina Faso Water Security Project. This operation, which is now in preparation and includes associated services (especially irrigation) and transboundary dimensions, has a tentative budget of \$150 million.

West Africa transboundary waters retrospective (Regional, 2021)

The West Africa Transboundary Waters Retrospective report,⁸ delivered in 2021, examined the World Bank's engagement in transboundary waters in the region over the past 20 years to derive lessons to inform future engagements. The report concluded that knowledge generation had focused on technical assessments of water resources and their management but not on detailed economic analyses of the water 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 within the World Bank's engagements on transboundary waters.

The analysis found that while RBOs have been the preferred partners to foster collaboration on transboundary waters, past RBO engagements may have limited the World Bank, leading to reexamination of both its role and priorities for the region. One recommendation was to integrate national and local governments, civil society, and the private sector in future WRM programs, while clearly articulating and sequencing interventions at all levels.

⁶ World Bank, 2022. Poverty and Shared Prosperity 2022. <https://www.worldbank.org/en/publication/poverty-and-shared-prosperity>

⁷ <https://www.worldbank.org/en/news/infographic/2022/09/19/g5-sahel-region-country-climate-and-development-report>

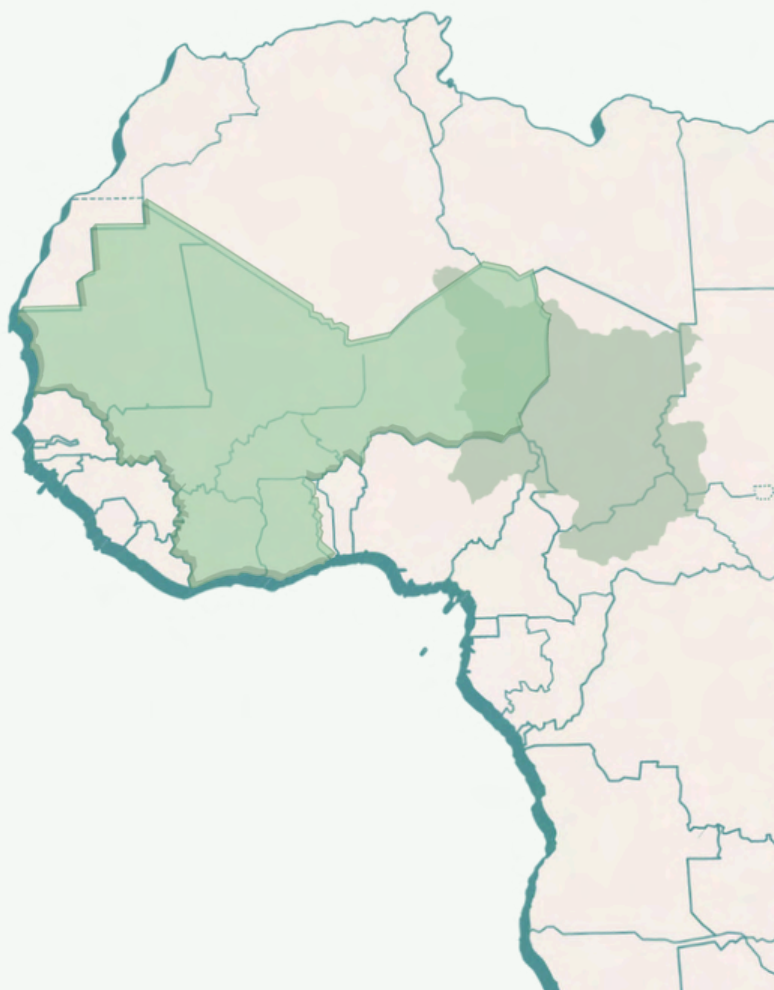
⁸ https://www.ciwaprogram.org/wp-content/uploads/CIWA_World-Bank-Engagement-Transboundary-Waters-West-Africa.pdf

Ghana—Addressing critical WRM challenges (2022)

The team conducted a rapid diagnostic to gather information for future WRM plans that will help sustain the livelihoods of people in northern Ghana and improve water security to support economic growth and reduce migration and conflict. The diagnostic identified seven key challenges to Ghana's management and use of the country's water resources, especially in the context of climate change and fragility, 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 cooperation with Burkina Faso. This diagnostic has served as the analytical basis and entry point for a new operation centered on water security and rural development in northern Ghana.

Cote d'Ivoire—Mobilization of water resources for development in Côte d'Ivoire (2022)

Côte d'Ivoire's challenges in managing its water resources include the need to update the assessment of available resources and associated demand and identify geographic areas and themes for priority investments. The CIWA-supported study provides a framework for addressing challenges such as managing increased demand from water-using sectors, trade-offs, and synergies between water allocations to various sectors; the unequal distribution of water between and within regions; water quality; and the need to safeguard water resources for future generations. It has served as the basis for preparation of a new World Bank integrated water security engagement—Côte d'Ivoire Water Security and Sanitation Support Project, with a focus on water security and economic development of northern regions.



Watering camel herd from Olouma well in Chad. ©André Benamour

Strengthening water security in the G5 Sahel (Regional 2022)

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, is seen as a more appropriate and pragmatic entry point to address water-related challenges than a rigid application of an IWRM- or RBO-centric perspective. It is important to (i) encompass the whole spectrum of water resources, including groundwater, river, 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, **Strengthening Regional Water Security for Greater Resilience in the G5 Sahel**,⁹ presents an analysis of water security challenges and their impacts on socio-economic development and stability and suggests directions for World Bank engagement. It provides a basis not only for deepening the dialogue with regional counterparts, but also for conceptualizing the vision of a regional water security initiative in Western Sahel (Development, Resilience and Valuation of Water for West Africa) under preparation as a series of projects that could include the Senegal and Niger river basins and key transboundary aquifers such as the SMAB and lullemeden aquifers. Discussions are ongoing to develop a project that responds to various water-related needs (e.g., increasing storage; addressing floods, droughts, and food security; and providing basic services) by supporting interventions at local, national, and basin/aquifer levels.

Operationalizing strategic storage in the Western Sahel (Regional, 2022)

Small-scale and nature-based solutions are critically important to provide reliable water storage to rural communities. With this CIWA-supported initiative, the World Bank has collaborated with a consortium of international partners to develop the Water Harvesting Explorer,¹⁰ a decision support tool for small-scale water storage planning. Now operational in its beta version, this tool can suggest water harvesting options at any location based on local biophysical conditions including precipitation, slope, and land. Implementing agencies in Niger and Nigeria are being trained on the tool's use for investment identification and community consultations for new projects. Currently, its application is limited to Western and Central Sahel, but multiple World Bank projects and teams in other regions have expressed interest in using the tool and expanding its functionality.

Identifying partners for CSO water dialogue in Western Sahel (Regional, 2022)

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.

An internal report delivered in 2022 by this activity, "Mapping Civil Society Organizations in the Sahel," had two key pillars: (i) identification of CSOs and analysis of their institutional relationships and policy and legal landscapes and (ii) generation of tools for leveraging Community-Based Associations (CBAs).

The study 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. Creating an initiative such as the Nile Basin's NBD will require a better understanding of the needs of CBAs and stronger collaboration with NGOs and CSOs to facilitate communication with governments and among themselves. The model could be operationalized by: (i) working closely with selected CSO and NGO partners in several countries and (ii) in parallel, initiating dialogue with basin-level counterparts (e.g., Senegal River Basin Development Organization [OMVS] and the Niger Basin Authority [NBA]) for integrating broad-based engagement into their core agendas. The progress of CSO diagnostics in Guinea and Senegal are on track to be delivered in October 2023, leading to an updated version of the final report in December. While work with NBA is on hold because of recent political developments in Niger, NBD is supporting the ongoing feasibility study.

Next Steps

Based on successful engagements with key national-level WRM counterparts in the region and renewed commitment to support the transboundary waters agenda, the World Bank's Africa West (AFW) team has restarted the dialogue with regional and national WRM institutions to develop a water security investments program. With active support of its donors and partners, CIWA intends to maintain its engagement by supporting the preparation of a series of transboundary and national projects with transboundary elements through this technical assistance.

These include:

- (i) **Development, Resilience and Valuation of Water for West Africa**, which would support Senegal and Niger river basin countries and organizations and key transboundary aquifers such as SMAB and lullemeden. To prepare this initiative, the team has launched a mapping of transboundary WRM stakeholders and their interest in the work.
- (ii) **Burkina Faso Water Security Project**,¹¹ which would secure water resources by rehabilitating priority dams, strengthen national capacity to operate and maintain dams, and develop watershed actions to reduce land erosion and sediment flows into reservoirs.
- (iii) **Cote d'Ivoire Water Security and Sanitation Support Project**,¹² which will implement part of the National Water Security Strategic Plan focused on the most water-insecure areas of Cote d'Ivoire (the area above the 7th parallel). The project will finance the rehabilitation of water storage infrastructure and strengthen the sectoral IWRM framework through the improvement of water management and key water institutions, supporting the reforms to the service delivery model and putting in place systems to ensure sustainable water resources management, infrastructure operations and maintenance, and quality water and sanitation service provision.

⁹ <https://www.ciwaprogram.org/rcv1/strengthening-regional-water-security-for-greater-resilience-in-the-g5-sahel/>

¹⁰ <https://sahel.acaciadata.com/>

¹¹ <https://projects.worldbank.org/en/projects-operations/project-detail/P177094>

¹² <https://projects.worldbank.org/en/projects-operations/project-detail/P177118>

Sahel Groundwater Initiative

Context

The Sahel,¹³ one of the poorest regions in the world, is facing a dramatic conjunction of threats. As many as 80 percent of 135 million Sahelians live on less than US\$2 per day and in rural areas where violent extremist groups remain active. Fragility and conflict are increasing. As these pressures rise, the risk of cross-border tensions and conflicts will intensify. According to the United Nations, the Sahel, along with Senegal, also has the world's highest levels of gender inequality. Women's profound political, economic, and social exclusion¹⁴ is both exacerbated by, and contributes to, the dynamics of fragility in the region. Increasing the sustainable development of groundwater will be key to providing water security and socioeconomic benefits. However, most investments in groundwater facilities in the Sahel have not been made with a complete understanding of potential opportunity costs.

The Sahel Groundwater Initiative closed in June 2023. The following is an account of achievements since the technical assistance began in 2020. It was a first step of a broader engagement by the World Bank to improve groundwater management and contribute to long-term economic and social development of Western and Central Sahel. The initiative funded activities to enhance climate adaptation through groundwater-based irrigated agriculture, assess opportunities to develop and sustainably manage groundwater resources, reinforce transboundary groundwater governance, and identify opportunities to strengthen gender-inclusive Sahelian groundwater expertise. The initiative was organized around three pillars that complemented each other to achieve the development objective: (i) providing solutions to remove constraints on the use of groundwater for small-scale irrigation to sustainably improve the lives of small-scale farmers, (ii) delivering analytical activities to evaluate groundwater resources, and (iii) supporting long-term groundwater resource management by laying the foundation to train the next generation of regional groundwater experts.

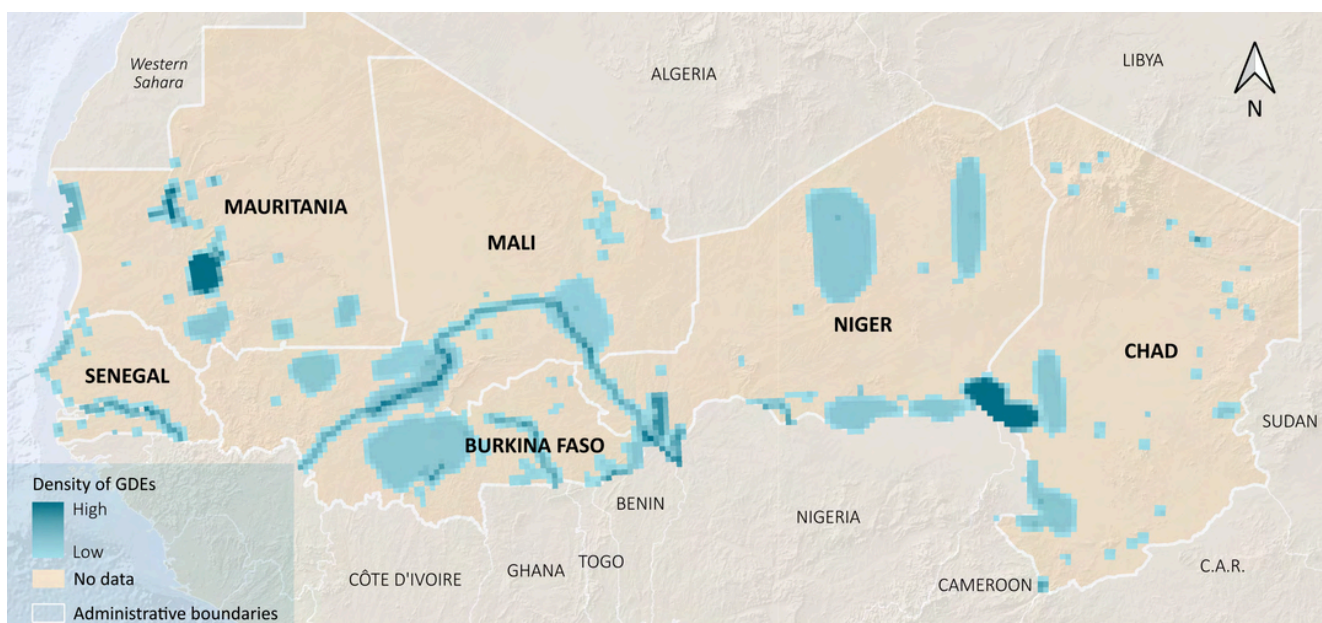
Progress

Supporting equitable groundwater-irrigated agriculture

Groundwater-based farmer-led irrigation development occupies only 9-to-12 percent of irrigated surfaces in Western and Central Sahel. Small-scale farmers face technical and infrastructure obstacles to developing groundwater irrigation including dry or collapsed wells and boreholes, low and declining yields, and low water storage. This technical assistance assessed groundwater irrigation techniques, shallow groundwater irrigation technologies, and gender barriers and proposed a series of pathways forward.¹⁵ The design and quality of well/borehole construction can be improved to enhance efficiency, raise extraction volumes, extend asset lifespan, and lower construction costs. Pumping costs and the complexities of operating and maintaining pumps are often barriers for small-scale farmers, particularly women and other marginalized populations.

Newer-generation solar pumps are a solution because of their affordable capital cost, lower operational costs, and relative simplicity of installation and maintenance. The activity's gender assessment identified that farming systems and land ownership should include mixed gender or 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.

This activity has also informed the ongoing discussion about the extension of the World Bank's Sahel Irrigation Initiative Support Project¹⁶ in six countries and the Niger Integrated Water Security Platform Project.¹⁷ The focus on shallow groundwater also served as a key marker on how the World Bank's groundwater flagship report, The Hidden Wealth of Nations: The Economics of Groundwater in Times of Climate Change, described the buffer capacity of groundwater sources.¹⁸



Density of groundwater-dependent ecosystems in Western and Central Sahel. ©P. Rambhunjun / World Bank

¹³ For this grant, Central and Western Sahel comprises six countries: Burkina Faso, Chad, Mauritania, Mali, Niger, and Senegal.

¹⁴ Castillejo, C. 2015. "Gender Inequality and State Fragility in the Sahel." FRIDE Policy Brief.

<https://www.files.ethz.ch/isn/191893/Gender%20inequality%20and%20state%20fragility%20in%20the%20Sahel.pdf>

¹⁵ CIWA Learning Note: Catalyzing Farmer-Led Irrigation Development in the Sahel from Shallow Groundwater.

<https://www.ciwaprogram.org/rcv1/catalyzing-farmer-led-irrigation-development-in-the-sahel-from-shallow-groundwater/>

¹⁶ <https://projects.worldbank.org/pt/projects-operations/project-detail/P154482>

¹⁷ <https://projects.worldbank.org/en/projects-operations/project-detail/P174414>

¹⁸ <https://www.worldbank.org/en/news/feature/2023/06/14/the-hidden-wealth-of-nations-groundwater-s-critical-role-in-a-changing-climate>

Groundwater-dependent ecosystems, pastoralism, and rural economies

The importance of groundwater has been increasingly recognized over the past decade, helped in part by the broader discussion around climate change and the recognition of the carbon sink role of groundwater-dependent ecosystems. Competition for groundwater can have irreversible consequences for groundwater-dependent ecosystems and contribute to the Sahel's fragility. In addition to high levels of poverty and armed conflict that resulted in the forcible displacement of 4.1 million people by the end of 2022,¹⁹ the region is a climate change hotspot, making it vulnerable to weather shocks. Climate change is expected to exacerbate tensions over water between pastoralists and farmers, and groundwater-dependent ecosystems are located along key population routes and fragility hotspots.

The Sahel Groundwater Initiative delivered a typology and preliminary mapping of 123 groundwater-dependent ecosystems across the six Sahelian countries.^{20, 21} Enhancing natural resources management of the Niger First Resilient Growth and Capital Building Development Policy Financing²² informed Pillar III. These results also constitute the first stage of a larger World Bank identification of groundwater-dependent ecosystems in Sub-Saharan Africa as part of a background paper prepared for the Hidden Wealth of Nations report. It described more than 4,807 groundwater-dependent ecosystems across four main geographic types—inland surface waters, coastal and marine ecosystems, oases and springs, and terrestrial vegetation. More groundwater-dependent ecosystems certainly exist and need to be identified, described, and characterized against the proposed typology. Use of the Sahelian groundwater-dependent ecosystem typology helps demonstrate the importance of accounting for socioeconomic systems in the development of conservation policy.

Pastoralists rely on groundwater and groundwater-dependent ecosystems for their livestock, migration patterns, and subsistence. This activity assessed the co-dependencies of rural and pastoralist livelihoods on groundwater management and development²³ in a One Health vision,²⁴ which recognizes that the health and well-being of humans, animals, and their shared ecosystems are interdependent and presents an integrated, multisectoral framework for pandemic prevention and overall health care. Pastoral communities gather at water points at specific times, presenting an opportunity to provide integrated health care services, including vaccination campaigns, to both livestock and pastoralists, while optimizing resources and sharing logistics (e.g., vehicles and cold chains).

This activity, which benefited the preparation of the World Bank's Regional Sahel Pastoralism Support Project,²⁵ determined that:

- Groundwater is a key resource for animal, human, and environmental health and overall pastoral development;

- Insufficient consideration of geological risks and the relatively low quality of construction jeopardize the durability of wells and boreholes dedicated to pastoralism. A special effort should be made to improve the quality of construction of wells and boreholes;
- To satisfy the needs for pastoral water, more wells and boreholes need to be constructed or rehabilitated to serve the still uncovered pastoral zones (about 1.2 million km², or 68 percent of the region's pastoral area), at a minimum investment of US\$225 million;
- The number and distribution of water points and rules to access and use water should be carefully matched to the carrying capacity and natural regeneration of pastures; and
- Local water access and power dynamics must be fully understood when developing new water points to prevent conflict and exclusion. More broadly, it is important to incorporate the management and maintenance of hydraulic infrastructures into traditional rights and management mechanisms.

Urban groundwater resources and climate change

Economic development projects can bring potentially adverse impacts on groundwater resources including soil sealing, which reduces aquifer recharge, and industrial and urban expansion, which can contaminate shallow groundwater. Climate change exacerbates these adverse impacts. In collaboration with the International Groundwater Resources Assessment Center and the National Institute of Water, an African Center of Excellence based in Cotonou, Benin that works on groundwater research, the activity included pilot studies in Bamako, Mali and Bobo-Dioulasso, Burkina Faso. The studies involved establishing a baseline for the quality of urban groundwater, and the results will guide future activities on urban groundwater quality management.

Groundwater expertise

This activity conducted an analysis of groundwater expertise that yielded two main findings. First, there are very few internationally recognized hydrogeologists who have broad and deep knowledge of Sahelian groundwater and who are from, and working in, the Sahel. Second, nearly all local groundwater expertise is at the mid-range technical level. Sahelian hydrogeologists work in a range of sectors including government agencies, the private sector, NGOs, project teams, and research organizations. Within this group, there is a continuum of capability and experience, but generally the tasks undertaken are not high level or strategic. These hydrogeologists have few opportunities to capitalize on groundwater knowledge about Sahelian hydrogeology produced by international research organizations, NGOs, development projects, and consultancies. Retaining hydrogeologists for post-graduate training and employment within the Sahel is problematic because of a lack of educational and work opportunities, resulting in a brain drain to other countries both in Africa and abroad.

¹⁹ [https://reporting.unhcr.org/operational/situations/sahel-situation#:~:text=In%202022%20the%20escalating%20conflict,internally%20displaced%20people%20\(IDPs\).](https://reporting.unhcr.org/operational/situations/sahel-situation#:~:text=In%202022%20the%20escalating%20conflict,internally%20displaced%20people%20(IDPs).)

²⁰ CIWA Learning Note: Uncovering the Socio-Economic Potential of Groundwater-Dependent Ecosystems in the Sahel.

<https://www.ciwaprogram.org/rcv1/ciwa-learning-note-uncovering-the-socio-economic-potential-of-groundwater-dependent-ecosystems-in-the-sahel/>

²¹ Rambhunjun et al. [In Press].

²² <https://projects.worldbank.org/en/projects-operations/project-detail/P178423>

²³ CIWA Learning Note: Harnessing the Potential of Groundwater to Enhance Pastoral Productivity in the Sahel.

<https://www.ciwaprogram.org/rcv1/ciwa-learning-note-pastoralism-groundwater-sahel-region/>

²⁴ <https://onehealthinitiative.com/>

²⁵ <https://projects.worldbank.org/en/projects-operations/project-detail/P173197>

Solutions to limit the exodus of Sahelian hydrogeologists and to develop their expertise include strengthening and diversifying North-South and South-South cooperation, creating workforce opportunities, and promoting knowledge transfer. Sahelian hydrogeologists should be included on international groundwater project teams as experts on the Sahelian context. In this way, groundwater knowledge from projects and international organizations could be capitalized on by Sahelian hydrogeologists and by the Sahelian groundwater profession more broadly.

Representatives of six regional institutions of higher education²⁶ met in Nouakchott, Mauritania in March 2022 to discuss how to strengthen regional groundwater expertise and attract promising candidates.²⁷ They identified the following gaps:

- Hydrogeology training does not meet international quality standards. Training programs often lack quality management systems for design, implementation, and monitoring;
- Students often do not meet prerequisites, notably in field geology, to enter a master's degree program in hydrogeology. Institutions that only deliver postgraduate training rarely offer basic courses such as sedimentology, tectonics, and other geoscience skills; computer science; or general hydraulics, identified as fundamental prerequisites for education in groundwater science;
- Curricula lack practical and field training and laboratories;
- Training is not always up-to-date with the latest scientific knowledge and technology, and topics about environmental concerns and climate change are often missing;
- Complementary subjects essential to the hydrogeology profession are often offered as optional courses or are insufficiently developed; and
- There are low numbers of women students and graduates in hydrogeology and related fields, which range from 5 percent to 40 percent (25 percent on average). Only academic institutions in Burkina Faso, Mali, and Chad try to achieve gender equality in admissions. Some institutions offer grants and scholarships for women, quotas, and targeted communication to encourage female candidates, but this is insufficient to counterbalance cultural norms that discourage women from pursuing male-dominated careers such as hydrogeology.

The regional institutions have proposed creating a common masters' degree program in hydrogeology and expanding efforts to recruit more women to academic study in the field.

Groundwater governance and conflict prevention and stabilization in the Sahel

Since the late 2000s, the countries of the Sahel have faced growing conflict and instability, and violent extremism is an increasing and deadly trend. The roots of this violence are linked to dissatisfaction with outmoded ways of governing through rent-extraction systems that benefit elites. Conflicts over natural resources that were previously handled through well-established, traditional conflict-resolution mechanisms are growing and deepening cleavages along ethnic lines.

This activity assessed the interplay among groundwater resources, climate change, and conflict and fragility within the Sahel in 2021 and provided strategic and operational recommendations for future work including:

- The Sahel needs a regional institution to coordinate groundwater development and management and facilitate cooperation like the SADC Groundwater Management Institute (SADC-GMI), NBI, and IGAD in other regions;
- As security forces are increasingly responsible for WRM, they need to be trained on drilling for groundwater and social and development issues linked to conflict prevention and peacebuilding including human rights training;
- Gender sensitivity must be mainstreamed into groundwater programs for stabilization and conflict prevention;
- World Bank teams and other development partners need to encourage discussions about conflict sensitivity around water investments and projects with government counterparts; and
- Project teams need to closely engage with local communities and institutions to promote local ownership and fairer allocation of resources.

This activity informs the ongoing preparation of the Development, Resilience and Valuation of Water for West Africa and the CIWA technical assistance to the Regional Working Group created for transboundary management of SMAB.

A VIEW FROM THE FIELD:

Learn about how water security specialist Abibata Ouattara unpacks the major obstacles that women encounter when accessing and managing groundwater irrigation on page 46.



© Abibata Ouattara

²⁶ National Engineering School in Bamako, Mali; Al-Asriya University in Nouakchott, Mauritania; Sciences and Techniques Institute in Niamey, Niger; Cheikh-Anta-Diop University in Dakar, Senegal; N'Djamena University, Chad; and University of Ouagadougou in Ouagadougou, Burkina Faso.

²⁷ <https://www.ciwaprogram.org/blog/training-the-next-generation-of-groundwater-specialists-in-the-sahel/>

Next Steps

Protection of groundwater-dependent ecosystems in the Sahel and their integration into the regulation, planning, development, and management of land and water resources will unlock their potential and avoid activities that affect their integrity and functions. Groundwater-dependent ecosystem protection also requires legal provisions and institutional arrangements including creating protection zones to safeguard groundwater quality and reduce degradation. Monitoring of groundwater-dependent ecosystems should be implemented to identify anthropogenic pressure trends and take necessary measures to preserve ecosystem services.

Building on CIWA's work, which elevated the profile of groundwater-dependent ecosystems and their importance, the World Bank will identify and monitor groundwater-dependent ecosystems with the goal of preserving the ecosystem services they provide. Based on the typology and preliminary groundwater-dependent ecosystem mapping, the World Bank engaged with the Government of Niger on the economic importance of groundwater-dependent ecosystems in arid rural areas. Niger then initiated a series of institutional reforms to identify, monitor, and protect its groundwater-dependent ecosystems. The World Bank is supporting these reforms through the First Resilient Growth and Capital Building development policy financing and plans to replicate this work in other Sahelian countries.

At the 8th session of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes²⁸ in 2018, cooperative development of SMAB was highlighted as a priority for support to establish international agreements and strengthen SMAB institutions. Sahelian countries have expressed interest in cooperating on SMAB development, which has launched a regional process (supported by the CIWA grant) to identify the issues at stake and a way forward. CIWA is supporting the creation of a roadmap for the development of a joint vision and program to establish long-term cooperation on SMAB resources—a one-year technical assistance, hosted by the SMAB Regional Working Group Secretariat.

Lake Chad Transboundary Water Security Context

The Lake Chad Basin is home to an estimated 59 million people,²⁹ many of whom depend on the lake for food security and livelihoods. Human development indicators are especially low in the basin, encompassing Cameroon, Chad, Niger, and Nigeria, with access to basic services including water and sanitation generally below national averages (except for in Chad). Delivering water services to a growing population will continue to challenge governments. Moreover, climate change exacerbates structural challenges, with direct consequences and risks for food security and job opportunities linked to the lake and its resources.

This technical assistance, which closed in June 2023, assessed the status of water security and transboundary cooperation in the basin at the political (vision), institutional (roles), and technical (investments) levels. It had two pillars: Pillar I built the analytical and institutional foundation for water security, while Pillar II informed the identification and design of activities to catalyze future investments.

Progress

Lake Chad transboundary water security assessment

The Lake Chad Basin water security assessment (WSA) categorizes the drivers of water insecurity and sources of resilience and makes recommendations to inform investments. Stakeholder feedback was incorporated through workshops in October 2022 and March 2023 with members of the Lake Chad Basin Commission (LCBC) and the Lake Chad Region Recovery and Development Project (PROLAC) and Member State focal points.

Drivers of water insecurity include climate change and weather variability, sedimentation, population growth and migration, inadequate institutions, poverty, economic instability, and FCV situations including violent extremism. Declining water quality is an emerging driver. The surface water in the basin is not polluted enough to cause ecosystem collapse, but endemic water-related diseases including malaria, cholera, bilharzia, guinea worm, and onchocerciasis increase risks to people.³⁰



Woman walking on the sand with a traditional jar on her head. ©Muhammad Usman Ghani/ IWMI

²⁸ https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-5&chapter=27&clang=_en

²⁹ The population was estimated at 37 million in 2004 and 45 million in 2012. A growth rate of 2.5 percent would mean a population of 59 million by 2023 and 150 million by 2050.

³⁰ LCBC (2016).

Despite significant risks and barriers to water security, the basin has sources of resilience that can be enhanced and promoted to help ensure a water-secure future. In the World Bank's Lake Chad Risk and Resilience study of 2022,³¹ sources of resilience included:

- The basin has an agro-pastoral and fisheries socioeconomic system, thanks to adaptation strategies (especially at the community level) in the face of ongoing challenges. For example, communities will shift from agriculture to livestock farming and fishing when risks of flooding seem high.
- Mobility remains a hallmark of Lake Chad communities.
- Citizens, CSOs, and the private sector increasingly mobilize to demand better governance and inclusion.
- Traditional and religious leaders help diffuse tensions and manage conflicts, especially at the community level.
- The basin's four countries increasingly recognize the need to improve cross-border cooperation and reintegrate former combatants.

Recommendations include improving data information systems to foster better decision making, particularly about groundwater; managing flood and drought risks; and enhancing strategic water resources development. The current lake information system and knowledge platforms are good first steps, but information is inadequate for planning and decision making. This is especially true for understanding groundwater inputs and outputs and their interaction with surface water. Other gaps in data include the regulatory framework for groundwater, limited knowledge about water use and availability, and how climate change may impact decision making. Even though LCBC's Water Charter provides a legal mandate to address regional water issues, it does not have a mandate to collect water data in countries; it is particularly important to improve coordination and consolidation of existing data to identify gaps and provide better data collection and exchange, including promoting the use of telemetry and remote sensing (RS) information systems.

It is also important to strengthen traditional and religious conflict resolution mechanisms to reduce tensions over natural resources, resolve power struggles between groups, and ensure equitable access to water. Local peacebuilding initiatives have shown progress in other transboundary basins such as the Sio-Malaba-Malakisi Basin in the Horn of Africa, where conflict and climate change have impacted water resources.³² Such grassroots efforts have helped enhance communities' capacity to deal with intercommunal tensions and reduce the risks of declining water quality.



Technical workshop on groundwater-dependent ecosystems.
©François Bertone/CIWA

³¹ World Bank. (2022). "Lake Chad Regional Risk and Resilience Assessment."

³² Kim, Broek, Smith, Michel, De Nys, & Godoy. (2021). Water Cooperation in the Horn of Africa: Addressing Drivers of Conflict and Strengthening Resilience.

World Bank programs such as PROLAC have identified the importance of promoting small-scale infrastructure to improve agriculture and local livelihoods, and there is potential to enhance their effectiveness through incorporation into watershed planning. At the local level, communities have relied on shallow and deep wells for abstracting groundwater, but these wells often have a short lifespan, and most of them dry up before the dry season ends. Small-scale and nature-based infrastructure can enhance water supply, but their benefits should be weighed against ensuring sustainability of the water resource in an arid environment where groundwater recharge is very low. Recommendations on infrastructure should be assessed based on the impacts of climate change, local stressors, sustainable yields, and shifting agricultural products and markets to ensure maximum benefits from sustainable water usage.

The recent multi-donor Lake Chad Strategic Action Program provides a set of nature-based solutions and actions, such as rainwater harvesting to increase water storage and the conservation and rehabilitation of wetlands as natural water purification infrastructure. Solutions also include upland tree planting to reduce runoff and sedimentation and tree planting for aeolian wind breaks—processes of erosion, transport, and deposit of sediments that are caused by wind at or near the surface of the earth—to reduce wind-generated siltation from the desert.

Overall, recommendations support capacity building of regional, national, and local institutions and inclusive decision-making processes involving local governance structures, including women, youth, marginalized groups, and others; improvement of data and information systems; enhancement of the financial capacity of regional and local institutions to better respond to water security issues; and expansion of small-scale infrastructure and NBS to improve local water security.

Water and the climate-conflict trap

The thematic note on the Water and Climate-Conflict Trap reflects the perspectives shared by LCBC in February 2022 by examining water-related risk factors that affect local communities and contribute to increased tensions and conflict. These factors range from large-scale impacts of climate change on the water cycle affecting farming and pastoralism patterns; demographic and economic growth that increases pressure on resources, including through the agricultural value chain; and large movements of people through migration or displacement that create tensions and disrupt traditional resilience mechanisms that historically have helped mitigate conflict. Knowing more about the respective contributions of these factors to fragility could help inform interventions in the basin under broader stabilization and development arrangements.

To address the weaponization of water, the note recommends the approach of environmental peacebuilding, which encompasses nature conservation and water security for peace. Research suggests that water security interventions can address environmental change and foster peace.³³ The note refers to situations where water has been used as a weapon in Lake Chad Basin, which usually occurs in areas that are already experiencing conflict and where armed groups take advantage of marginalized people and weak social cohesion. For example, in 2021, terrorist groups poisoned water resources in Lake Chad to increase fragility and further destabilize control over natural resources.³⁴



Fisherman on Lake Chad. ©LCBC

The note found that climate, water, and conflict interact through a multidirectional relationship and vicious cycle called the climate-conflict trap, where extreme weather events and water insecurity heighten fragility and conflict, hindering the ability of communities to adapt to climate change. These conclusions clearly align with the idea that projects need to use an integrated problemshd approach (IPA) to water security.³⁵ IPA frames water security in terms of both local and regional challenges and broadens the scope of transboundary cooperation to include improving development within the context of systemic challenges (e.g., poverty, political economy, climate, FCV), instead of waiting for challenges to be resolved.

The role of civil society organizations in the water sector

The technical assistance characterized LCBC's current engagement with CSOs and the opportunities created by PROLAC's support of knowledge management activities. LCBC indicated that this was a natural part of its work as a regional commission and shared with the team several CSOs with which it is active including the International Union for Conservation of Nature, which has an office in Cameroon.

This initial scoping of the CSO context suggests that there is potential for advancing water management by promoting collaboration between community associations and NGOs; however, it recommends this with caution, noting that there is a wide variation in abilities and that more work is needed to determine an effective and efficient network and mechanism for delivery in each country.

³³ Tobias Ide, Adrien Detges; International Water Cooperation and Environmental Peacemaking. *Global Environmental Politics* 2018; 18 (4): 63–84. doi: https://doi.org/10.1162/glep_a_00478

³⁴ Nett and Rüttinger, 2016. https://climate-diplomacy.org/sites/default/files/2020-10/CD%20Report_Insurgency_170724_web.pdf

³⁵ <https://www.ciwaprogram.org/blog/the-integrated-problemshd-a-solution-for-water-security-in-the-g5-sahel/>

The note found that CSOs face challenges with their advocacy in the basin including legal frameworks and laws that hinder their ability to perform their duties. In Cameroon, a law excludes CSOs from receiving subsidies or donations from individuals and reserves individual donations for associations recognized as being of “public utility.” In Chad, NGOs have expressed concern that various ordinances and decrees limit their autonomy; in fact, Chad's National Development Plan 2017-2021 does not include a role for actors other than the government. In Niger, the legal framework does not permit the creation of NGOs, only of associations. In Nigeria, the government has enacted regulations that preclude CSOs from being sufficiently active, and activists in the country face harassment.

Groundwater institutional diagnostic and comparative assessment of legislation

The objective of the activity was to generate structured data, information, and knowledge regarding the institutional and legal framework in which groundwater is managed.

The groundwater note focused on national legislation and institutions that inform and support the governance of groundwater in the Central African Republic, Chad, and Niger and provided an assessment of such legislation and institutional arrangements. The analysis includes regional and global legal frameworks for the governance of transboundary aquifers.

Hydromet needs assessment

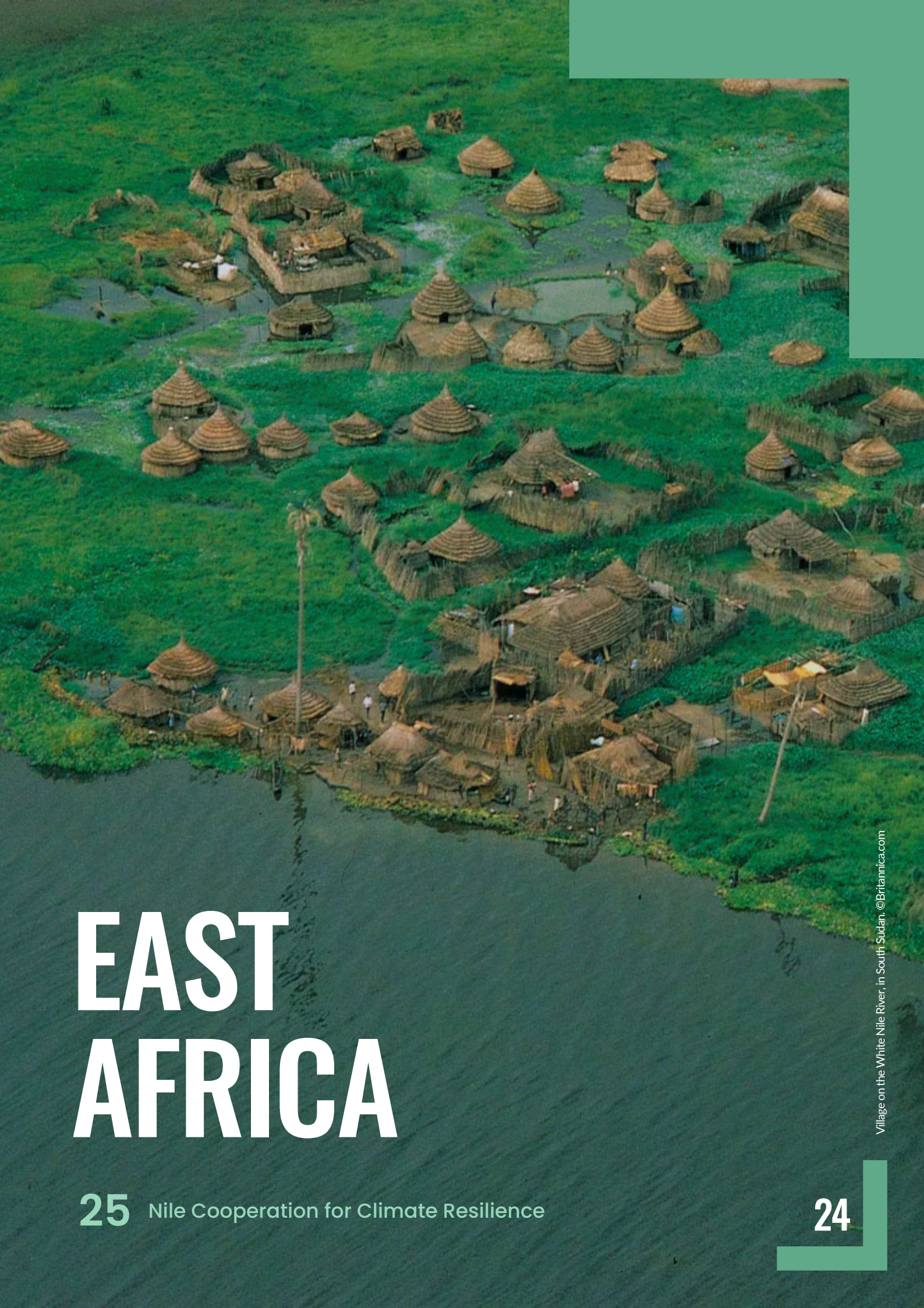
The technical assistance produced a Hydromet report following an evaluation mission to the countries and LCBC Secretariat to make an inventory and recommendations to support LCBC and member countries and partners to engage with LCBC to help it implement its mandate effectively. The objective was to promote (i) better knowledge of the state of water resources and, more generally, of the environment of the basin, necessary for informed decision making on public investment policies in the water sector and (ii) the development of associated uses (e.g., agriculture, fishing, and livestock rearing) with appropriate, effective, and transparent consultation between the States and other stakeholders in the sustainable development of the basin.

Next Steps

The WSA will be made public in FY24. Other outputs, such as the Hydromet report and the groundwater institutional assessment, have been discussed with, and amended by, LCBC. LCBC recommendations have been taken on board for each output. The WSA is providing a reliable and updated source of information about the status of water security in the entire basin. The reports on Hydromet groundwater should help improve the monitoring networks, knowledge, and groundwater legislation in basin countries.



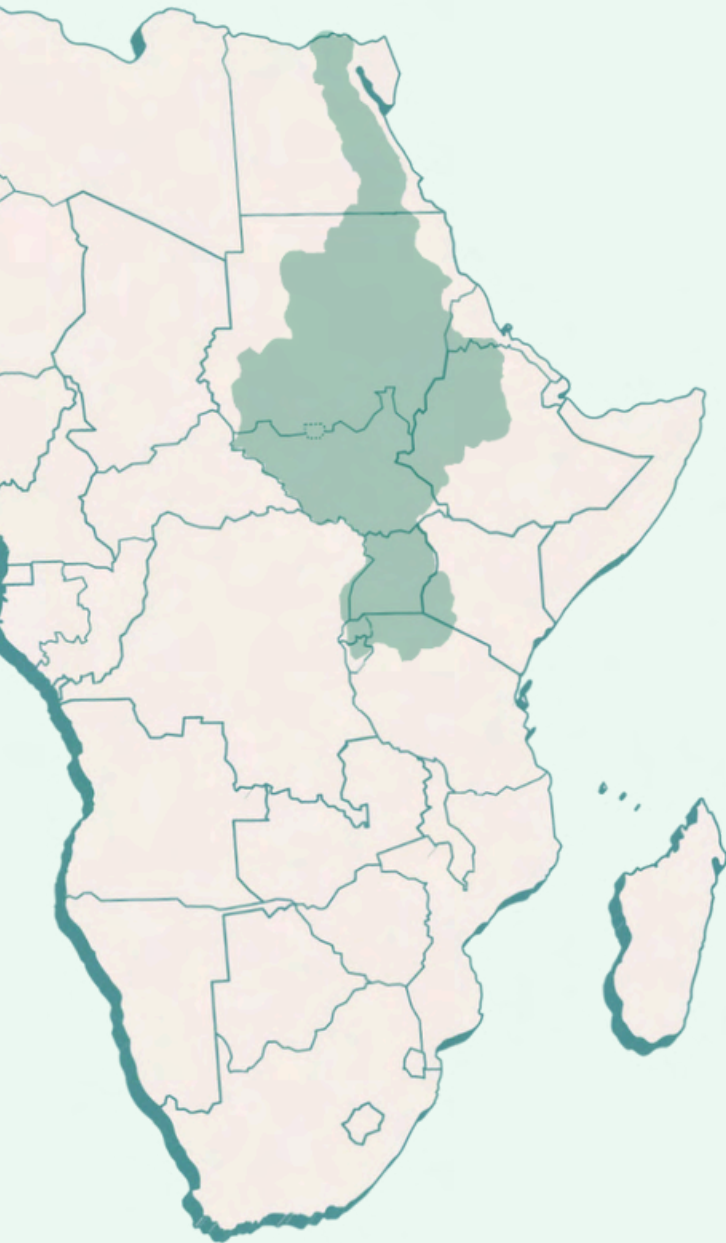
Using a rope pump to collect water. ©Petterik Wiggers / IWMI



EAST AFRICA

25 Nile Cooperation for Climate Resilience

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East Africa

East Africa faces numerous 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 working to enhance the region's resilience to worsening climate change and water insecurity and providing opportunities for riparian dialogue and hydro-diplomacy.

Nile Cooperation for Climate Resilience Context

Nile riparian countries have a common interest in sustainable socio-economic development, which requires collaboration. Transboundary water cooperation and equitable management and development of shared water resources can help countries achieve prosperity. Eleven countries share the Nile River and its basin, with each facing unique challenges and having ambitious national development plans to fuel economic growth and alleviate poverty. The benefits and sustainability of many investments can be enhanced by taking a regional perspective, and cooperative development and management of transboundary waters can generate substantial win-win benefits to help unlock the basin's full productive potential for more prosperous, long-lasting national and regional growth. CIWA's NCCR project builds on over two decades of Multi-Donor Trust Fund support, first through the Nile Basin Trust Fund and now CIWA.

A long-term engagement, NCCR provides complementary support in the areas of information, institutions, and infrastructure. Through the project, the three NBI centers (Eastern Nile Technical Regional Office [ENTRO], Nile Equatorial Lakes Subsidiary Action Program Coordination Unit [NELSAP-CU], and the Nile Secretariat [Nile-SEC]), NBD, and LVBC collaborate to support flood and drought risk warning, mitigation, and preparedness; improve dam safety; manage water quality around the Nile Basin and Lake Victoria Basin; build and disseminate information services for climate-resilient investment planning; and provide a platform for communities, decision makers, and water managers to cooperate in the sustainable use and management of water resources.

NCCR is benefitting from complementary Bank-executed grant support for flood inundation and mapping and remote detection of dams and reservoirs (Global Facility for Disaster Reduction and Recovery [GFDRR]) and for preparing the Lake Victoria sanitation strategy (Korean Green Growth Trust Fund [KGGTF]).



Rusumo Falls Hydroelectric Project, Rwanda. ©Anders Jagerskog/CIWA

Progress

Platform for Cooperation

The project helped advance the “One NBI” approach and philosophy through such activities as Technical Working Groups representing governments; inter-agency coordination across thematic groups (floods and droughts, water quality, dam safety, information services, gender, and monitoring and evaluation); and support for regional governance and advocacy events such as Nile Day, Nile Strategic Dialogue, and preparation for the Nile Basin Development Forum.

The Nile Basin Council of Ministers recently approved the first Nile River Basin Management Plan, whose objective is to guide the planning and implementation of water resources management and development interventions at national, sub-regional, and regional levels. Ministers of Water Affairs and representatives from NBI Member States, diplomats, Technical Advisory Committee (TAC) members, development partners, governments, media, and the public convene regularly to discuss regional issues.

NBI is in the second half (2022-2027) of its 10-Year Strategy,³⁶ and the new Basin-wide Program (BWP) is the institution’s flagship planning tool, which builds on the achievements and lessons learned from the first BWP.

The ENTRO Young Professionals and Internship programs continue to progress well. Currently the fifth cohort through NCCR is focusing on “Socioeconomic and SDG 6 indicators mapping;” notably all four countries in the Eastern Nile (including Egypt) have participated in the program.³⁷ ENTRO has proposed doubling the number of interns, and Nile-SEC and NBD have recently hosted pilot cohorts.

ENTRO has educated journalists about the benefits of transboundary cooperation and water resources investments and conducted an innovative stakeholders’ forum with a diverse audience including religious leaders, dam safety operators, and members of Parliament.

All three NBI centers and LVBC reasserted civil society’s role to advance cooperation in the Nile and recognized NBD’s leadership. The centers agreed to further engage NBD to implement activities that require civil society participation. Through May 2023, NBD established a Regional Nile Women’s Network, which consists of 10 grassroots Women’s Networks across Nile Basin countries and a Regional Coordination Committee to oversee efforts and identify key challenges (e.g., illiteracy and lack of basic education, which undermine women’s ability to be involved in water decision making, and domestic obligations, which burden women, who therefore have limited time to participate), and opportunities. These networks are platforms for women’s engagement in integrated water resources management and planning and voices of influence in various projects, including NCCR’s activities on flood and drought early-warning systems. A leadership committee for each network guides its work.³⁸

Information services for climate-resilient investment planning

NBI is working to modernize the use of public-domain data and analytics to better visualize and use a wealth of data and analytics. The procurement and installation of the European Organization for the Exploitation of Meteorological Satellites GeoNetCast equipment is complete in Nile-SEC and ENTRO, which will enable access to global data and services without internet challenges to support activities that rely on real-time data such as flood forecasting.

Cloud Services have been shared across the NBI centers, a consultancy is now underway for Nile Basin Data and Analytic Services (NB-DAS), and NBI has created a stakeholder group that is being engaged for outreach, discussion, and knowledge sharing. NB-DAS needs assessments have been completed with all Member States. Synergy with other initiatives and data services is being explored to facilitate integration into NB-DAS, interactive products, and the Integrated Knowledge Portal.³⁹

Water quality investment planning and prioritization

The NBI Secretariat conducted a workshop in Kigali, Rwanda to review and validate an inception report on water quality monitoring in the Nile Basin and introduce Regional Water Quality Working Group members to NCCR activities on enhancing availability and use of water quality data executed by Nile-SEC.

The centers are supporting national water quality monitoring networks and regional water quality information systems to facilitate Nile Basin Member States in jointly addressing and reversing the impacts of deteriorating water quality. To enhance availability and use of water quality data, Nile-SEC is procuring and installing water quality monitoring equipment. The water quality monitoring network design report has been updated with the technical specification for the monitoring equipment and feedback from an inception validation workshop. A needs assessment for implementing water quality monitoring was conducted in nine countries, and the findings will be presented at a validation workshop.



NCCR team field visit to the Hydromet station in Jinga, Uganda. ©Yukio Tanaka/ CIWA

The development of a Nile Basin water quality database and course map that will facilitate hotspot selection for a multi-criteria analysis that NELSAP-CU is conducting is almost finalized. The Zambezi Watercourse Commission (ZAMCOM) hosted a study tour with over 30 TAC members, water quality experts from Member States, and experts from NBI centers, LVBC, and NBD to observe water pollution control interventions, database centers, and water monitoring systems so participants could share experiences with different water monitoring systems and tools.

LVBC is conducting regional policy harmonization and developing a water quality strategy and action plan for Lake Victoria. It submitted an inception report, which was reviewed at a regional workshop with national focal points from respective ministries. LVBC also developed a stakeholder analysis and engagement plan. Situational analysis on water quality policy and strategies has been carried out for seven partner states.

³⁶ <https://www.nilebasin.org/images/docs/NBI-Strategy-2017---2027.pdf>

³⁷ 20 interns at ENTRO (37 percent women; 50 percent from FCV countries), three at Nile-SEC, and four at NBD focusing on transboundary water cooperation, flood forecasting, and early warning.

³⁸ <https://www.nilebasin.org/news-blog/community-blog.html>

³⁹ <http://ikp.nilebasin.org/>

NCCR leveraged KGGTF to produce a regional strategy for Lake Victoria Basin-wide Inclusive Sanitation. Along with the strategy, the activity also explored opportunities for promoting private sector participation and job creation and technology and efficiency in sanitation/reuse. This work built on CIWA's Lake Victoria Water Quality technical assistance (FY21) and is now informing the design of a large-scale IDA-funded regional integration project.

Using the selection criteria developed and endorsed by COM in FY22, baseline studies for water quality/pollution hotspots in the Lake Victoria Basin at Mwanza Gulf on the Tanzania side and Gilgel Abbay on the Ethiopia side were conducted and validated in an Addis Ababa workshop. NELSAP-CU will use the water quality database and course map to identify two hotspots and apply multicriteria analysis to prioritize potential water quality investments.

Flood and drought risk management

NCCR conducted field site visits for flash flood early-warning development planning and government consultations in Burundi, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, Tanzania, and Uganda. NELSAP-CU also conducted an emergency consultation with the Government of Rwanda in May 2023 in response to flooding that killed 100 people. The government and NELSAP-CU are now exploring how to leverage NBI's flood information services to enhance the country's flood resilience and capacity for damage assessment.

Eastern Nile flood early-warning improvement implementation started in January 2023. The project has completed key milestones including (i) identification and analysis of flood-prone areas, (ii) development of a basin-wide flash flood early-warning system, and (iii) completion of a drought needs assessment. ENTRO, NBD, and NELSAP-CU conducted a joint field visit to South Sudan. ENTRO and NBD are implementing flood gender-sensitive community awareness activities and enhancing citizen engagement in Eastern Nile countries. Basin-wide drought early-warning system development activities are at an early stage, but implementation is expected to accelerate in FY24.

Dam safety capacity building

Over the last year, NCCR has worked to increase capacity to manage dam safety risks. National Dam Safety Units are a focal point for this thematic area with work underway to assess the current regulatory environments and to support countries to improve safety oversight. The project is also supporting NBI's efforts to enhance the information base on the state of dams and reservoirs beginning with a basin-wide dam inventory. With the support of complementary Bank-executed funding, NBI is deploying cutting-edge Remote Sensing (RS) and machine learning approaches to identify and geo-locate dams to provide a fuller picture of existing conditions. This will inform risk classification of dams and help riparian experts understand the needed level of oversight.

Technical trainings for the first part of the project have been completed. NCCR plans to support the establishment of a regional training facility on dam safety. Work to produce a business plan and identify potential partners for the facility is expected to begin in FY24.

Next steps

In May 2023, NCCR conducted its midterm review to assess progress toward implementation and achievement of the project Development Objective, identify obstacles and bottlenecks, and agree on improvements or adjustments. Overall, NCCR has disbursed 44 percent of funds, established systems necessary for project implementation, and picked up speed after early implementation delays.

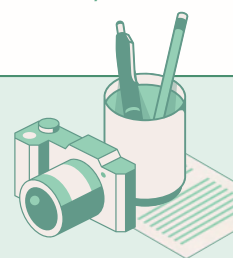
Now in its second half of implementation, NCCR is on track to achieve its objectives, which include creating or enhancing regional institutional capacity, information systems, and cooperation platforms to identify, prioritize, and plan regionally relevant investments in dam rehabilitation, flood and drought management, Hydromet, and water quality. These investments can then be advanced by future national and donor-funded projects, resulting in impactful and sustainable climate adaptation.

NCCR activities during FY24 will build on key results from the first half of the project. The Nile Basin Development Forum, planned for October 2023, will showcase project results and continue to strengthen the knowledge and network of Nile Basin water professionals. The drafts of regionally harmonized water quality policies will be completed and presented at a regional validation workshop; the NEL regional water quality strategy and action plan will be completed and presented at a validation workshop; installation of water quality equipment is planned to start in 2024; all centers will implement Gender Action Plans; LVBC will develop gender-sensitive indicators for its water quality strategy; and Nile-SEC will complete the Decision Support System needs assessment and create help desk services. It is critical that the centers harmonize data/analytics activities (e.g., ongoing and proposed consultancies in ENTRO and NELSAP-CU) and the work on the NB-DAS platform. With all but the Democratic Republic of Congo (DRC) consultations completed, NELSAP-CU is moving toward development of a flash flood early-warning system, which is expected to be completed by January 2024.

NCCR also leveraged additional IDA funding for ENTRO and NELSAPCU via the new Eastern and Southern Africa Regional Climate Resilience Program so they can work closely with South Sudan in addressing the transboundary dimension of the floods.

A VIEW FROM THE FIELD:

Read how Asia Namusoke is making a difference for her Ugandan community and the climate on page 47.





HORN OF AFRICA

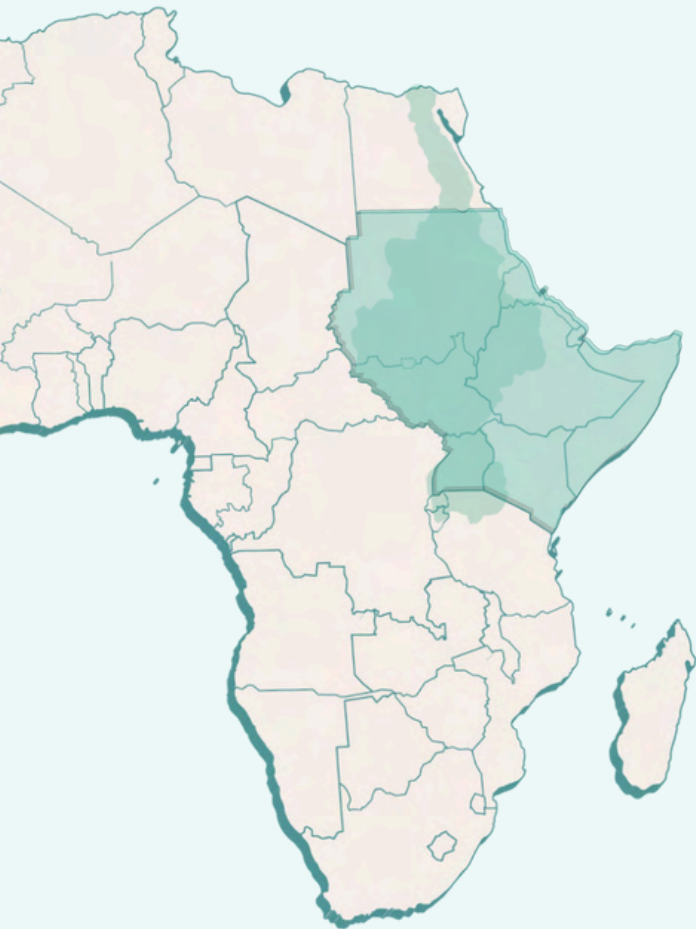
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Untapping Resilience: Groundwater Management and Learning in the Horn of Africa's Borderlands

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South Sudan Transboundary Waters Support Program

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Horn of Africa

The Horn of Africa is facing cascading impacts from the worst drought in four decades, which CIWA is working to help ameliorate. CIWA also strives to improve access to groundwater as the region's cornerstone of water security. It is expanding the knowledge base on groundwater, strengthening the capacity of partners to manage and develop this valuable resource, and improving regional initiatives to build resilience.

Progress

Untapping Resilience: Groundwater Management and Learning in the Horn of Africa's Borderlands

Climate change impacts on weather and temperature are displacing millions of people in Ethiopia and Somalia and affecting the entire HoA.⁴⁰ The region was experiencing its fifth consecutive rainless "rainy season" when, in March 2023, torrential rains inundated Ethiopia and Somalia, resulting in flash floods that swamped crops and washed away topsoil.⁴¹ Many people in Ethiopia, Somalia, and Sudan are simultaneously affected by displacement and eruptions of violence and conflict between competing factions or against the government. In a region where surface water is scarce because of high evapotranspiration rates, groundwater is key to adapting.⁴² While groundwater is still largely untapped, sustainable access and management of this resource can help address drivers of fragility, including frequent water-related communal disputes in the borderlands.

Untapping Resilience (with its linked World Bank project, GW4R),⁴³ continues to build on long-term support by CIWA to reduce the Horn's vulnerability, build resilience, and combat fragility through regional integration. In 2019, the World Bank's HoA Groundwater Initiative (GWI) supported IGAD to ramp up technical expertise in groundwater resource management and development and supported five countries (Djibouti, Eritrea, Ethiopia, Kenya, and Somalia) to begin planning for improved regional integration around water security. At the same time, CIWA was building the data and information foundation needed for transboundary water cooperation, while working closely with Somalia's Ministry of Water and Energy through a Bank-executed grant to build institutional capacity, human capital, and transboundary aquifer (TBA) knowledge.



Community gathering at the local well. ©World Bank

⁴⁰ Rigaud, et al., (2018) Groundswell: Preparing for Internal Climate Migration. © World Bank

⁴¹ <https://earthobservatory.nasa.gov/images/151208/heavy-rains-hit-drought-stricken-horn-of-africa>

⁴² World Bank (2017). Climate Resilience in Africa: The Role of Cooperation Around Transboundary Waters, World Bank, Washington, DC.; Clifton, C., et al., (2010) "Water and Climate Change: Impacts on Groundwater Resources and Adaptation Options," Water Working Notes, Note No. 25, June 2010, World Bank, DC.

⁴³ <https://projects.worldbank.org/en/projects-operations/project-detail/P174867>

The success of these and other World Bank programs⁴⁴ laid the groundwork for the US\$385 million regional IDA program GW4R. Phase I of GW4R, which launched in June 2022, includes Ethiopia, Kenya, Somalia, and IGAD. The preparation of Phase II is underway with South Sudan and Djibouti. IGAD plays a central role as the main promoter and facilitator of a long-term regional strategy on groundwater collaboration, including data and information sharing. Phase I activities include constructing medium- and small-scale infrastructure (including nature-based solutions) to provide sustainable access to groundwater resources in the borderlands, developing information and knowledge on regional aquifers, and building capacity (local, national, and regional) on groundwater management and governance.

In the HoA borderlands, crucial information and communication necessary for development implementation are often constrained by difficulty accessing field sites given their remoteness, insecurity, and overall fragility. In response, CIWA's Untapping Resilience grant is complementing GW4R through two areas of support: (i) the development and implementation of a regional learning agenda around groundwater in the borderlands, led by specialized consultancy firms with experts on the ground, and (ii) enhancing the capacity of implementing entities (especially IGAD) to gather, analyze, and use data to mitigate risk, learn, and adjust, including through state-of-the-art remote monitoring tools. Gaining real-time insights on local dynamics and implementation is crucial to inform adaptive management and ensure that the program achieves its intended impact. While CIWA's support is focused on the design and implementation of phase I, the emerging lessons will inform the preparation of phase II.

Untapping Resilience will provide institutions with knowledge and capacity around (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. Lessons learned in these areas will also inform World Bank operational practices on sustainable groundwater access and management in fragile contexts and strengthen IGAD's regional role in the creation of economies of scale on transboundary groundwater management.

Progress

Component 1: Enhanced knowledge and learning on groundwater in the HoA

This component involves two main types of deliverables: (i) a Management Information System (MIS) using innovative remote monitoring tools and (ii) a set of knowledge products focused on three thematic pillars:

- Sustainable Groundwater Service Delivery
- Groundwater's Role in Addressing Fragility and Enhancing Resilience in the Borderlands
- Groundwater and Regional Integration

During the first year of implementation, the technical assistance established the basis of the GW4R program's learning agenda and is developing a robust MIS to enhance the selection of project sites, monitoring, and progress tracking and foster evidence-based learning across participating countries and IGAD. MIS provides an efficient tool to address diverse information needs across multiple client institutions in complex FCV contexts, especially in remote borderlands with limited roads and mobile network coverage.

Untapping Resilience's MIS comprises an interactive data visualization dashboard and a series of open-source data collection instruments to help stakeholders register, monitor, and supervise all program investment sites while aggregating results at regional levels and allowing comparisons of progress across countries and regions. MIS supports a uniform registration of all program investment sites in Ethiopia, Kenya, and Somalia and enables cross-checking of their eligibility against safeguards and technical standards. It also allows quarterly monitoring of progress at both site and contract levels.

As the project advances, MIS will also provide a robust evidence base for the development of knowledge products and facilitate cross-country learning. MIS has been launched with the Power BI platform in participating countries, and Untapping Resilience trained 130 people in Somalia, Ethiopia, and Kenya on the use of MIS including dashboard and questionnaire data entry, editing, and validation. This is strengthening the capacity of project stakeholders at regional, national, and local levels to use innovative digital and geo-referenced tools for data collection, monitoring, and learning.

Sustainable Groundwater Service Delivery

The United Nations Development Program (UNDP) Africa Borderlands Center leads applied research under Pillar I of the GW4R learning agenda on Sustainable Groundwater Service Delivery.⁴⁵ UNDP is laying the foundation for a comprehensive georeferenced database as part of MIS. This initial compilation is also identifying data gaps and reasons for borehole failure that can be addressed through the GW4R program's implementation.

Research under this learning area includes the application of a regression-based Stat+ Sustainability Check of the Somalia, Kenya, and Ethiopia datasets to identify factors that predict the failure of rural water supply and sanitation (RWSS). Using the georeferenced data, UNDP tested multicriteria decision-making statistical tools to prioritize borehole sites for rehabilitation. Criteria are based on regression analyses to identify factors that predict borehole functionality, with borehole yield being a dominant factor. Field data collection by UNDP has been conducted in Ethiopia and Kenya, and the analysis is ongoing.

Preliminary results from the assessment of Turkana, Mandera and Garissa indicate that the majority of boreholes are functional (76%). The dominant cause of failures lie with electro-mechanical pump problems, although solar-powered pumps failed less often than other pumps. The length of the pipeline was negatively associated with functionality.

Groundwater's Role in Addressing Fragility and Enhancing Resilience in the Borderlands

Borderland communities are exposed to multifaceted challenges including climate change, competition over scarce resources, conflicts, and socio-economic disparities.⁴⁶ The confluence of these factors exacerbates social exclusion and vulnerability to climate change impacts.⁴⁷

⁴⁴ <https://blogs.worldbank.org/nasilkiza/turning-sand-water-biyooole-project-somalia>

⁴⁵ <https://www.undp.org/africa/africa-borderlands-centre>

⁴⁶ Pflaum, M. (2021), "Pastoralist violence in North and West Africa," West African Papers, No. 31, OECD Publishing, Paris, <https://doi.org/10.1787/63dff519-en>.

⁴⁷ Andy Catley (2017)

https://www.researchgate.net/publication/325312253_Pathways_to_Resilience_in_Pastoralist_Areas_A_Synthesis_of_Research_in_the_Horn_of_Africa

The Rift Valley Institute is leading applied research on the intersection of groundwater, development, conflict, and climate change and is conducting key informant interviews with core institutions, a comprehensive literature review, and primary data collection in selected communities. Deep dives are being conducted in the Kalabeyei refugee site in Turkana County, Kenya; Balembela, Somalia; and Dillo Kabele, Ethiopia.

The overall objectives of the study are to understand dynamics related to water, fragility, and social exclusion that can inform RWSS development or rehabilitation and to build the capacity of key stakeholders involved in the development of these systems.

Groundwater and Regional Integration

This pillar is focused on developing a vision and roadmap for effective regional collaboration on groundwater management. Work under this pillar is strongly rooted in the recognition that developing and managing groundwater in the borderlands will require expansion and harmonization of data collection, strengthening of institutional capacity at national and regional levels, and closer cooperation between countries and with IGAD.

During the inception phase, the operation compiled and disseminated an overview of existing models and examples of transboundary collaboration in groundwater management, lessons learned, and an analysis of groundwater conditions, availability, challenges, potential, and risks related to groundwater development in the borderlands. CIWA presented and discussed results with IGAD Member State representatives during a Regional Learning Event held in Addis Ababa in May 2023. Upon further data gathering and country consultations, the team will draft a Regional Vision and Roadmap for consideration by IGAD and Member States.

Component 2: Enhanced institutional capacity on groundwater management

Key to achieving enhanced groundwater management is strengthening the institutional capacity of groundwater institutions. Untapping Resilience is focusing on translating groundwater knowledge into enhanced implementation in Ethiopia, Kenya, and Somalia; strengthening IGAD's role in addressing country demands for value-added groundwater information; and assisting with their capacity-building needs.

The technical assistance is achieving this by delivering tailored national and regional capacity-building workshops linking state-of-the-art research, shared knowledge, and experiences that can be used by participants to strengthen GW4R program implementation.

Enhanced institutional capacity of IGAD and Member States for transboundary groundwater management

CIWA's support has enabled a strong emphasis on addressing key knowledge gaps about identified TBAs and building institutional capacity for enhanced groundwater for resilience supervision and monitoring in complex borderland areas. Key institutional capacity and learning events this year included:

- IGAD's Regional Learning and Training Workshop: Designing Resilient Rural Water Supply Systems in the HoA (Addis Ababa, Ethiopia)
- Approaches for Drilling Contracts in Ethiopia under the Ethiopia GW4R program (virtual)
- World Bank Engagements in Transboundary Aquifers: Lessons learned, Challenges, & Way Forward (hybrid)

IGAD's Regional Learning and Training Workshop: Designing Resilient Rural Water Supply Systems in the HoA

This workshop, which took place in May 2023 in Addis Ababa, provided lessons and recommendations to inform and strengthen project implementation and advance the GW4R regional learning agenda, institutional capacity, and collaboration around sustainable groundwater management and use. More than 70 GW4R project stakeholders and experts from Ethiopia, Somalia, and Kenya and regional and international researchers working on the GW4R learning agenda participated in the workshop to discuss technical issues that are key to the design of resilient RWSS.



Agriculture field with its irrigation system. ©World Bank



Herder fetching water for his sheep cattle. ©World Bank

IGAD presented a 'Procedure for data sharing between IGAD and IGAD Member States' for GW4R activities. The document outlines the significance and key principles of sharing data through a regional Network of Groundwater Centers, which is being established by IGAD and participating countries.

Approaches for Drilling Contracts in Ethiopia under the Ethiopia HoA Groundwater for Resilience Project

This event gathered top international and local hydrogeologists and engineers, along with project implementing agencies, to discuss procurement, contractual, and technical aspects of sustainable drilling, which is of major importance given the region's low drilling success rate. In Kenya, for example, the well failure rate is estimated to be between 33 percent and 40 percent.⁴⁸ The event emphasized that addressing and mitigating the risks associated with drilling (e.g., risks in siting, geology, design, and construction) and adopting different procurement, contractual, and supervision strategies can maximize successful drilling outcomes.

The workshops and exchange of experiences on procurement of contracts made the GW4R Project Implementation Units (PIUs) aware of potential risks, which are being addressed through a more robust revision of Terms of Reference (ToRs) and firm evaluations by experts. This practice is also helping ensure that quality assurance and lessons learned are implemented.

World Bank Engagements in Transboundary Aquifers: Lessons Learned, Challenges, & Way Forward

This session was organized during the World Bank's Water Week 2023 and focused on sharing emerging lessons from SADC and country experiences on transboundary aquifer development and management. The event also included a discussion about the design of a GW4R transboundary water supply pilot project between Kenya and Somalia. The Dhobley-Liboi Water Supply project was identified through the Merti feasibility study conducted by IGAD with CIWA's support as part of HoA GWI. Participants provided recommendations on institutional and legal aspects, information and data sharing, and technical and procurement considerations to inform the design of the pilot.

The recommendations shaped preparation of a more in-depth study/situational analysis of the water supply and socio-economic status in the transboundary area, which was key to shaping countries' decision to proceed with implementation of the TBA pilot, expected to contribute to long-term regional trust-building and collaboration processes. In turn, the analysis served as the key discussion piece during a meeting between Somalia and Kenya GW4R PIUs, which agreed to explore the next steps toward collaboration.

⁴⁸ Origa, J. (2017). Water schemes functionality crisis in Kenya: Policy recommendations for private partnership. Nairobi, Kenya.

Next Steps

During its first year of implementation, **Untapping Resilience** has created a solid basis for a regional groundwater learning agenda and MIS that are aimed at enhancing GW4R implementation and impact. Going forward, the following key areas will be addressed:

- **Groundwater data sharing and collaboration:** Continuous work on the development of a robust MIS that pulls together key groundwater information resources that are currently scattered or not easily available in the public domain. These efforts will be done in close coordination with IGAD and participating countries through the development of the Horn of Africa data-hub.
- **Robust site selection:** Ongoing research and analysis conducted as part of the learning agenda will support the selection of sites for GW4R investments. This selection process will integrate sustainability and suitability tools, and the methodology and selection criteria will be closely coordinated with countries.
- **Emphasis on sustainability:** Findings from the applied research will be brought into MIS to ensure that data on critical issues is used toward sustainable approaches to GW access and management.
- **Quality assurance:** The project will keep providing quality assurance through knowledge exchange, revision of program documents by experts and specialists, and knowledge sharing between countries to strengthen implementation and lessons learned. Robust implementation will be enhanced through a learning event on the procurement and management of drilling contracts.
- **MIS consolidation:** The system will continue its consolidation and use throughout implementation. Efforts will also be made in the onboarding and integration of GW4R Phase II countries into MIS to strengthen regional data and foster cross-country learning.

South Sudan Transboundary Waters Support Program

Context

South Sudan faces formidable economic, socio-political, and climate challenges. Since it gained independence in 2011, the country has experienced chronic instability, protracted civil war, and frequent natural disasters caused by climate change. Fragility and conflict resulted in more than 8.9 million people of a population of 12.4 million needing humanitarian assistance in 2022.

The country faced record flooding in 2021, which affected more than 1 million people, including displacing more than 300,000 and causing food insecurity and damage to livelihoods and social cohesion, especially for girls and women. At the same time, seasonal flooding sustains livelihoods for about 6 million people living along the Nile and Sobat rivers and in the eastern and western floodplains.

South Sudan's water-related risks and opportunities are fundamentally transboundary in nature, as the Nile Basin contains all the country's surface and groundwater resources. Upstream conditions therefore influence water availability and the occurrence of floods and droughts.

Although South Sudan's nascent water management institutions are working to address many water challenges, they face severe constraints. Draft water legislation has been pending since 2013.

The Ministry of Water Resources and Irrigation (MWRI) lacks capacity and has limited physical infrastructure to carry out its mandate. Information systems and the Hydromet monitoring network are weak and the use of decision support systems to guide water resources management is minimal. To address these structural challenges, the government of South Sudan is beginning a reform and investment program including improving water cooperation with neighboring countries, as enhanced transboundary water collaboration can contribute significantly to reducing flood and drought risk.

The World Bank is providing technical assistance to strengthen capacity for water resources management. CIWA's activity, launched in June 2023, is a Bank-executed grant that seeks to deepen dialogue and strengthen knowledge for sustainable planning and management of transboundary water resources to increase water security.

CIWA's technical assistance will be structured around three pillars:

- Supporting transboundary water management and water resources planning
- Strengthening regional information exchange
- Supporting knowledge generation and capacity building with a focus on biodiversity and FCV

Next Steps

The initiative will provide technical support to MWRI on transboundary water cooperation and management and conduct analytical activities to map and quantify the hydrological ecosystem services provided by the Sudd wetland. It will also support South Sudan's efforts to learn from international best practices for transboundary water management, including from the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

CIWA's South Sudan Transboundary Waters Support Program will support the South Sudan component of the Eastern and Southern Africa RCRP by facilitating South Sudan's participation in the Nile Basin dialogue and technical capacity, including via improved data sharing protocols and renewed dialogue and participation in regional and global water events. Moreover, this ASA will finance a first strategic analysis of the hydrological (including flood-regulating) services provided by the country's ecosystems and biodiversity, including the Sudd wetland. This analysis is expected to benefit all Nile riparians, as it will provide a more granular and updated understanding of the contribution of South Sudan's ecosystems to the basin's hydrological behavior and balance.



World Bank Water Practice Manager Soma Ghosh Moulik speaking at the Horn of Africa's—Groundwater for Resilience Project launch. ©World Bank



SOUTHERN AFRICA

35 Southern Africa Drought Resilience Initiative

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Southern Africa

Prolonged drought conditions in Southern Africa are fueling food and water insecurity, poverty, and economic fragility. CIWA is addressing 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 sustainable management of transboundary aquifers.

Southern Africa Drought Resilience Initiative

Context

SADRI was a CIWA technical support program from 2020 to 2023 that built analytical and institutional foundations to catalyze national and regional investments in drought preparedness and create more resilience to the multi-sectoral impacts of drought among the 16 Member States of SADC. SADRI's work was structured around four pillars: an Umbrella pillar and three sub-pillars on (i) Cities, (ii) Energy Systems, and (iii) Livelihoods and Food Security.

SADRI's vision was of a drought-resilient SADC region in which governments, institutions, and households develop proactive mechanisms to withstand climate change impacts and associated economic shocks. SADRI worked to develop a platform for dialogue; promote integrated drought risk management across the Water, Energy, Food, and Environment (WEFE) nexus; and improve coordination to lay the foundation for proactive, multi-sectoral drought resilience.

Progress

Umbrella Pillar

The initiative completed national and regional stocktaking and needs assessments of 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 for each SADC Member State and a regional Profile, which captured commonalities and key opportunities and guided consultation processes. These outputs will be used to help identify future potential regional drought risk management investments. The SADRI team also developed a Knowledge Hub⁴⁹ on Drought Resilience to disseminate the initiative's key learnings, which supported knowledge exchange and fostered stakeholder dialogue. The World Food Program integrated Knowledge Hub output into its Regional Vulnerability Assessment and Analysis Program (RVAA).⁵⁰

Cities Pillar

Despite the expectation that droughts will increase in frequency and intensity, most countries and cities still address droughts through crisis response and management. It is critical to instead adopt proactive, integrated, and regionally harmonized approaches to drought risk management. SADRI pioneered the development of the Urban Drought Risk Management Framework (UDRMF), which facilitates integrated, proactive, preventive, comprehensive, and people-centered drought risk management. UDRMF aims to reduce existing drought risks and potential impacts of drought, prevent new risks, and strengthen resilience by recognizing links between drought, poverty, urbanization, and development. SADC cities would greatly benefit from building capacity to develop their own drought-monitoring and early-warning systems based on this framework. SADRI used the framework to develop the Urban Drought Risk Management Toolkit and a Regional Guidance Note for SADC countries.

SADRI tested UDRMF by conducting seven pilot case studies in Southern Africa cities.⁵¹ These case studies began with discussions with city officials and stocktaking of their urban drought management. Findings were discussed with national and city officials to identify measures to further assess drought risks and improve drought management. SADRI then conducted an exhaustive analysis of countries' drought monitoring capabilities, resources, and products, which showed inactive urban drought monitoring systems. The Urban Drought Toolkit recommends that cities adopt UDRMF and develop systems that leverage existing drought-monitoring capabilities and tools such as global drought monitors, coupled with hydrometeorological data (precipitation; temperature; Normalized Difference Vegetation Index; and dam, stream, and piezometric measurements) and models. SADRI recommends two groups of mitigation measures based on the risks and vulnerabilities identified: (i) preventive measures to minimize drought impacts and (ii) contingency or responsive measures to reduce impacts as droughts unfold.

The final step in the UDRMF planning process is the adoption of monitoring procedures to ensure implementation of drought assessment and response systems. The urban drought risk management plan should be monitored, periodically evaluated, learned from, updated, and improved to ensure the plan's continued suitability and responsiveness to water needs.

⁴⁹ <https://geowb.maps.arcgis.com/apps/MapJournal/index.html?appid=cb0fc8aa450f4b35a018f7e0115867be>

⁵⁰ <https://rvaaatlas.sadc.int/>

⁵¹ Toliara, Madagascar; Dar es Salaam, Tanzania; Blantyre, Malawi; Gaborone, Botswana; Windhoek, Namibia; Bulawayo Zimbabwe; and Cape Town, South Africa.

Energy Pillar

Droughts directly impact hydropower, which represents 21 percent of Southern Africa Power Pool (SAPP) capacity and is the second largest source of power in the region (after coal and other fossil fuels) and is better in the context of climate change.⁵² DRC, Lesotho, and Zambia generate almost 100 percent of their electricity from hydropower, making them particularly vulnerable to drought.

The SADRI team conducted a Drought Sensitivity and Resilience Assessment (DSRAS) for SAPP to understand the potential impacts of climate change on energy security across member countries and outline adaptation and power system development measures. DSRAS is a tool to help identify, prioritize, and sequence energy investments under different climate change adaptation pathways and is structured into three phases:

- **Phase 1:** Analyzing the sensitivity of hydro-energy generation to climate-influenced drought
- **Phase 2:** Power system modeling, climate risk management planning, and options analysis
- **Phase 3:** Identifying priority investments and adaptation pathways for drought resilience

In Phase 1, SADRI conducted hydrological analyses of the Congo, Zambezi, Rufiji, Cuanza, and Cunene River basins using the Water Evaluation and Planning tool⁵³ and determined potential impacts of climate change on streamflow and energy generation for the Congo and Zambezi River basins. The analyses demonstrated that Zambezi Basin hydropower plants (HPPs) are highly vulnerable to drought, while Congo Basin HPPs are instead largely buffered from projected climate change impacts, which can be attributed to projections showing a wetter future in the Congo Basin and generally lower HPP capacities than the basin's hydropower potential, particularly at Inga. As a result, the Congo Basin has sufficient water to operate the currently installed HPPs at close to full capacity even when river flows are reduced during droughts. There is a strong opportunity to build drought resilience by developing hydropower generation capacity in the Congo Basin, along with high-voltage direct-current interconnectors to bring power to demand centers in the Zambezi Basin. Even in the absence of drought, eight of the 12 SAPP countries face a shortfall in meeting current electricity demand. Increased regional integration of power systems and electricity trade can alleviate both regular and drought-induced power shortages.

Livelihoods and Food Security Pillar

Investing in climate-smart agricultural (CSA) practices and diversifying economies simultaneously is critical to safeguard vulnerable livelihoods against droughts and climate change. Practices such as agriculture risk planning and financing that consider GESI can diversify livelihoods away from subsistence agriculture to enhance resilience. SADRI strategically focused on CSA and livelihoods diversification as the main levers to enhance drought resilience in the agricultural sector by analyzing food reserve policies across the region and developing agri-food value chain solutions for drought risks.

Building smallholder resilience to drought through irrigation improvement

Drought-related water insecurity is the main constraint to smallholder farmers producing surpluses for the market, building their asset base, and saving to improve household food security and resilience. With very small land plots (less than half a hectare), diversification into higher-value irrigated crops is an opportunity to greatly increase incomes but requires improved capture, storage, and distribution of water. Hydrological and land use assessments are critical for identifying locations where improved irrigation can be effective. For example, even with investments to improve water capture and storage, if there is insufficient water to support irrigated agriculture, other measures may be better alternatives to increase productivity. Even where water is potentially available, investment in improved irrigation could be a high-risk option, as farmers must grapple with multiple constraints simultaneously such as the initial costs of infrastructure, ensuring cash flow while tree crops mature, and securing access to agricultural inputs, technology, finance, and markets. These constraints need to be addressed comprehensively both across the watershed and along the value chain to improve access to technology and markets.

SADRI conducted land use suitability and hydrological assessments in South Africa's Eastern Cape Province and identified potential locations for irrigation improvement under three models. These include homesteads (0.3ha each, total 3,000ha), riverside farms (50ha each, total 11,000ha), and former estates (500ha each, total 2,000ha). SADRI prioritized homestead irrigation because it does not suffer from the intractable land tenure issues of other models and storing surface water run-off is a key opportunity for this model. SADRI proposed homestead rainwater harvesting (RWH) investment plans (including pond- and solar-fed irrigation) and water availability modeling to the Eastern Cape Province Government (ECPG). The proposed investment was financially viable albeit with high investment costs of around US\$7,300 per homestead, necessitating public funding. The ECPG has expressed interest in supporting this by reallocating funds and is currently preparing a budget proposal. Local agribusinesses also expressed interest in developing partnerships for input supply and marketing if water supply constraints could be addressed and a critical mass of homesteads identified.

SADRI collaborated with the South Africa Agricultural Business Chamber and the International Finance Corporation (IFC) to consult with potential agribusiness investors. In 2021, two agribusinesses agreed to work with SADRI on (i) identifying locations for macadamia production based on solar-powered RWH for homesteads and (ii) conceptualizing investments in macadamia production based on an estate-outgrower model in which homesteads, rather than estates, would be the outgrowers. To help ensure the sustainability of the water supply, SADRI identified other necessary investments in the five watersheds including land restoration, agroforestry, biomass entrepreneurship, improved livestock and pasture management, upstream water harvesting, and improved water management. A landscape approach to drought resilience requires work with livestock and other value chains upstream and horticulture and agriculture downstream.

⁵² The Intergovernmental Panel on Climate Change (IPCC), in its Fifth Assessment Report, noted that only wind and nuclear power have lower median lifecycle greenhouse gas emissions than hydropower.

⁵³ An integrated water resources planning tool used to represent current or future water conditions in each area. <https://www.weap21.org/>

A VIEW FROM THE FIELD:

Read on **page 49** on how water resource manager **Dr. Eddie Riddell** worked on projects aiming to safeguard livelihoods and tackle water and food insecurity in the Southern Africa region.



Next Steps

After SADRI's closing in 2023, the project's team members are continuing to support country and client engagement around drought resilience-building. This includes several dissemination events and efforts to link with ongoing and future operations, such as the World Bank's Regional Climate Resilience Program for Eastern and Southern Africa Series of Projects. Opportunities also exist for continued engagement through the various thematic pillars, as outlined below.



A farmer stands on cracked earth on his farm in Groot Marico, South Africa. ©VoA

Strategic food reserve policies

In Zambia and Zimbabwe, Strategic Grain Reserves (SGRs) have been used as a tool to cope with emergency food shortages arising from increasing floods and droughts. However, the efficiency and effectiveness of SGRs in addressing food emergencies have been less clear. In 2021, SADRI commissioned a study, *The Role of Strategic Grain Reserves in Enhancing Food Security in Zimbabwe and Zambia*,⁵⁴ to provide a diagnostic of SGR operations and management of emergency food responses and recommend improvements. The study highlighted that SGRs in both countries have the potential to contribute to food security only when the fiscal cost is contained, keeping the reserves to amounts sufficient to meet food shocks. As a result, SGRs should be considered as tools to address short-term food security challenges, while the main food security strategy should focus on addressing drivers of insecurity through investments that enhance long-term resilience and productivity.

Options for livelihood diversification in the Great Limpopo Trans-Frontier Conservation Area (TFCA)

TFCA are natural systems that encompass one or more protected areas straddling at least two national boundaries. Communities living in and around TFCA are among the more marginalized groups in Southern Africa and largely derive their livelihoods from land-based activities, including agriculture. The Great Limpopo Trans-Frontier Conservation Area (GLTFCA) Joint Management Board⁵⁵ has designated the GLTFCA Pafuri-Sengwe Node as a key socio-economic development focus area in its Integrated Livelihoods Diversification Strategy. Key challenges include water security governance and resource management issues, food security concerns, and climate change.

SADRI analyzed water governance and use practices on the Limpopo, Mwenzei/Nuanetsi, Luvuvhu, and Bubby rivers in Pafuri-Sengwe to inform plans for drought preparation and mitigation and improve river system governance at the community level. The analysis sought to determine the extent of water availability in targeted aquifer, wetland, and river systems. A series of maps was created to delineate the wetland systems in the project area linked to the river systems using geographic information system (GIS) mapping and RS. SADRI also conducted a hydro-census to assess current water demand and usage, especially by communities, and existing governance structures and practices for managing these waters. SADRI then developed country- and transboundary-specific recommendations and investment needs to build the drought resilience of communities dependent on the region's freshwater resources.

Another key component of SADRI's work in the TFCA was leveraging local knowledge about natural resources management and strengthening stakeholder engagement around drought resilience. No integrated, holistic approach to improve water resource governance and management has been used yet, but a multi-stakeholder transboundary approach is required for the effective management of transboundary water resources to ensure their efficient and fair use and provide a common platform for improving drought resilience. Building this multi-stakeholder approach included consultations with community elders to document traditional and indigenous knowledge and the creation of a technical reference group from TFCA implementing agencies to guide activities.

⁵⁴ <https://elibrary.worldbank.org/doi/abs/10.1596/35811>

⁵⁵ GLTFCA covers an area where the borders of Mozambique, South Africa, and Zimbabwe meet.



Woman walking next to the storm water drainage system, Beira, Mozambique. ©Franka Braun / World Bank

Cities

The regional overview of urban drought risk management and the city case studies conducted by SADRI show cross-cutting lessons learned and opportunities for improvement. These include the need for robust data production, collection, and sharing; effective use of internet technology; and capacity building of water utilities and national and city institutions for effective urban drought risk management planning. As a next step, options for resilient investments and policy recommendations (mitigation, preparedness, and response measures) should be discussed by the case study cities and their water utilities. The World Bank should explore opportunities to engage with other cities through existing country engagements on water, urban development, and disaster risk management.

Engaging SAPP

The SADRI team presented results of DSRAS Phase I to the Southern Africa Power Pool Coordination Center (SAPP-CC) in November 2022. After getting first-hand insights into the impact of drought on hydropower generation, SAPP-CC and utility members expressed great interest in pursuing the drought resilience agenda and subsequent phases of DSRAS. SAPP-CC's growing support for DSRAS and the active involvement of member utilities will benefit the work envisaged under DSRAS Phases II and III, particularly on required data, timely input, and buy-in at the utility level. A flexible and adaptable Drought Resilience Strategy and Action Plan for SAPP will be the final output of this engagement.

Funding for DSRAS phases II and III has been identified through other World Bank-administered Trust Funds. Phase II will comprise power system modeling (PLEXOS) to identify the key bottlenecks in SAPP's ability to ensure the security of supply at regional and domestic levels and explore power trade and infrastructure investments for improving drought resilience of the SAPP region from 2025 to 2065. Phase III will center on prioritization of the investments identified under Phase II, based on economic and financial evaluation of promising opportunities and preliminary environmental and social impact assessments.

Agri-food value chain solutions

Once ECPG's proposal for investment in RWH is finalized, site selection will be fine-tuned through observation of land suitability, hydrological assessment, and further consultations with communities and farmers on RWH design and beneficiary commitments. RWH will then be tested on a first batch of approximately 20 homesteads.

Livelihoods diversification in Trans-Frontier Conservation Areas

Potential areas for further support beyond SADRI will be identified based on the investment priorities to improve drought resilience in the Pafuri-Sengwe Node. A working session with key GLTFCA stakeholders is being planned to discuss outputs and outcomes and agree on the way forward. An action plan and a resource mobilization strategy will be developed to facilitate the implementation of key measures and investment priorities.

Sustainable Groundwater Management in SADC Member States—Phase II

Context

The SADC region is home to about 345 million people and has a population growth rate of about 2.9 percent, which is among the world's highest. Approximately half the population lives on less than an estimated US\$1 per day, and over 70 percent of people rely on groundwater as their primary water source. SADC Member States have an estimated 2,491m³/per capita/year in renewable groundwater but currently only use 1.2 percent of the resource. Groundwater is often used without proper knowledge of the aquifer potential or monitoring of its status and use, potentially leading to overexploitation or contamination, and jeopardizing sustainable groundwater use in the long term.

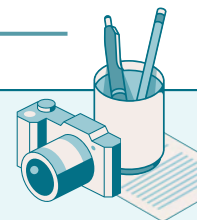
The Global Environment Facility (GEF) Trust Fund recently approved a grant of US\$4.57 million to SADC for the Sustainable Groundwater Management in SADC Member States Project Phase II (SADC-GWM Phase II) in addition to US\$9 million financed by CIWA. Now in its second year of implementation, SADC-GWM Phase II is scaling up activities to strengthen the transboundary dimension of regional groundwater resources and developing capacity and knowledge for inclusive groundwater management and use at national and transboundary levels.



Analytical work to fill knowledge gaps in water production, use, and governance in the GLTFCA Pafuri-Sengwe Node in the Great Limpopo Transfrontier Conservation Area (GLTFCA), southern Mozambique. ©Piet Theron / CIWA

A VIEW FROM THE FIELD:

Read how talented and motivated young female geoscientist **Matlhogonolo Mmese** is using geophysical and hydrogeological data to better manage groundwater resources on [page 50](#).



Progress

Component I: Capacity building and strengthening for sustainable groundwater management

The project is strengthening institutions at local, national, and transboundary levels to better manage groundwater. Through this project, SADC RBOs are incorporating groundwater management in their programs by establishing special committees to work on groundwater management and support development of groundwater management strategies and joint studies. The project is supporting development of the Limpopo Watercourse Commission (LIMCOM) Groundwater Strategy through the LIMCOM Groundwater Committee, which is expected to be completed in January 2024. The project supports establishing, and building capacity of, National Focal Groups (NFGs) within Member States to oversee groundwater activities at national level and provides a linkage between SADC-GMI and national stakeholders. Five NFGs (in Eswatini, Malawi, Mozambique, Namibia, and Zimbabwe) were established during Phase I. Additional NFGs are being formed in Lesotho, Mauritius, South Africa, Tanzania, and Zambia. When fully established and capacitated, NFGs will lead implementation of small grant projects and participate in groundwater advocacy and capacity building of local groundwater actors.

Several training programs were implemented to strengthen the capacity of national, transboundary, and regional SADC institutions. These include expansion of the Young Professionals program to incorporate non-English-speaking SADC Member States and the involvement of 22 Young Professionals from 12 Member States in enhancing the SADC Groundwater Information Portal (SADC-GIP). In collaboration with the USAID-funded Resilient Waters Program, the project has developed roadmaps for closing the policy, legal, and institutional gaps in groundwater resource management and implemented GESI strategies to enhance inclusivity in groundwater initiatives in the four LIMCOM countries (Botswana, Mozambique, South Africa, and Zimbabwe) following the completion of reports on the policy, legal, and institutional gaps for all 16 Member States.

Component 2: Knowledge development, dissemination, and advocacy

The objective of this component is to enhance knowledge about groundwater resources. SADC-GIP was updated with additional data, time series data, and big data analytics in September 2022. At the end of FY23, the numerical model for the Eastern Kalahari Karoo Transboundary Aquifer was 80 percent complete, while the Buzi, Pungwe, and Save (BUPUSA) Rivers E-Flows Hydrogeological Study was 75 percent complete. The knowledge products resulting from this project will encourage the participation of women who have acquired significant knowledge about water resources, including about the quality and storage methods of water in various locations.

SADC-GMI has signed Memorandums of Understanding (MOUs) with two universities in the region to collect and upload more records to the SADC Groundwater Literature Archive. A study has been commissioned to create and support the implementation of a regional groundwater monitoring network in three strategic aquifers: on the mainland, the coast, and an island. The Project Steering Committee has approved the selection of the Coastal Sedimentary Basin IV Transboundary Aquifer, shared between Angola and Namibia, for conducting Transboundary Diagnostic Analysis and Joint Strategic Action Plan and begun the procurement process.

Two Young Professionals have been accepted into the SADC-GMI Bursary Scheme for master's study at the University of Western Cape and the University of Botswana. Enrollment of students from the Island State (Mauritius) and Non-English speaking Member State (Mozambique) is currently in progress. The Groundwater Model for the Eastern Kalahari Karoo Transboundary Aquifer has been developed, and training has been completed.

Component 3: Building resilient livelihoods and inclusive groundwater management

This component focuses on building resilient livelihoods and inclusive groundwater management by implementing sub-grant projects within Member States. The sub-grant pilot projects, which have not yet begun, will support the piloting and scaling-up of sustainable groundwater infrastructure approaches, including surface water harvesting, managed aquifer recharge, community-led initiatives, innovative borehole design, and the expansion of groundwater monitoring networks. SADC-GMI has updated its sub-grant manual and held workshops on the use of the manual in nine of 16 Member States (Eswatini, Lesotho, Malawi, Mauritius, Namibia, South Africa, Tanzania, Zambia, and Zimbabwe). Six Member States (DRC, Eswatini, Lesotho, Mauritius, Malawi, and Tanzania) have submitted sub-grant proposals, with sub-grant agreements already prepared. Since Angola did not complete the activities of the sub-grant project in the previous phase, the completion is expected with an expansion of scope in the Caimbabo Water Supply sub-project.

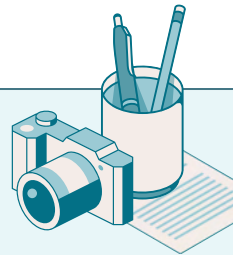
Next Steps

The project will encourage the participation of non-responsive Member States, particularly with Component 3. A deep dive into models for Environmental and Social Standards assessment for sub-grants is also needed to ensure that the project's environmental and social impacts are properly assessed and addressed. A follow-up meeting is planned to discuss Environmental and Social Management Plan development for grantees, including the scope and procedures.

The project will also update the Groundwater Literature Archive to reflect current outputs, establish eight more NFGs in SADC Member States, and enroll more Young Professionals, with a focus on increasing the participation of women. The capacity building plan will be updated and implemented, and Policy, Legal, and Institutional Roadmaps will be implemented. The project will also undertake more studies on TBAs and generate transboundary diagnostic analyses and joint strategic action plans to better understand regional groundwater challenges, such as the valuation of groundwater, groundwater in island states and coastal aquifers, groundwater-dependent ecosystems, the WEFE nexus, and groundwater in megacities. To support sustainable, resilient livelihoods and equitable economic development and build resilience to climate-related shocks, the project will scale up dissemination of data and information and implementation of innovative pilot projects to promote sustainable groundwater management practices and ensure the long-term health of groundwater resources.

A VIEW FROM THE FIELD:

Go to **page 51** to learn more about how **Mfundo Macanda** is developing inclusive, drought-resilient and sustainable agriculture by introducing micro-scale irrigation systems in the Eastern Cape of South Africa.





02 CROSS-CUTTING THEMES

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Cross-cutting Themes

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

CIWA supported 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 RS data for evidence-based decision making. This initiative helps governments and RBOs address constraints to cooperative water management by putting free or low-cost globally available data analysis tools in the hands of institutions that face challenges managing transboundary waters.

This technical assistance is building regional institutional capacity for, and demonstrating applications of, RS data platforms to improve management of transboundary waters. CIWA is helping clients adopt RS data and data platforms for decision making by (i) supporting end-to-end, sustainable, demand-driven services and (ii) testing and adopting efficient and free or low-cost hydro-informatics data, tools, and services. This initiative supports the activities through three pillars: (i) assessment of needs, (ii) capacity building, and (iii) adapting innovative tools for improved management of water resources.

WDR scoped the data demand and capacity of RBOs spanning 37 countries, which revealed data gaps and priority needs that could be mitigated through adoption of RS-based technology, data products, and analytical tools, while focusing on specific applications that communicate data and information to decision-making tools for better water governance. The assessment also highlighted the need to expand capacity to acquire and manage free or low-cost data for specific applications such as drought and flood analysis and water accounting tools. The assessment provided insights into organizational challenges in adopting digital data platforms, including financial constraints, lack of technical capacity, and staffing shortages.

WDR used the outcomes of the assessment to provide virtual capacity building for RBOs and research centers. CIWA organized the training session, “Modernizing Transboundary Water Data and Analytics Workshop,” conducted in English and French in June 2023, to demonstrate the application of RS data tools to improve management of transboundary waters and promote the use of free public-domain tools. The virtual setting enabled over 85 participants to attend the training and exchange ideas and experiences. The participants were able to re-imagine transboundary waters in an age of disruptive technology and received deep dives on combined in-situ and RS monitoring of hydrologic cycles and free or open-source modeling tools and analytics. Trainers connected participants to tools that can be used by people without extensive data science backgrounds. More workshops are planned for next fiscal year.

This technical assistance will use the assessment outcomes to enhance development of a dashboard to provide transboundary organizations timely information on the status of water resources management of their river basins at a seasonal scale. This dashboard, which will incorporate best practices, will be built from existing continental scale data to estimate water stocks and fluxes to support selected engagements in the region.

Gender Equality and Social Inclusion

CIWA is increasing its efforts to mainstream gender and social inclusion into its projects, particularly at the project development stage. In addition to engaging CIWA’s GESI expert to conduct gender and social inclusion analyses of CIWA projects, the program has developed tools and resources to enable World Bank task team leads and other staff to gain an understanding of GESI. CIWA will continue to raise awareness and build capacity about the importance of ensuring the systematic integration of a GESI lens into the development and implementation of projects. This includes plans to build the capacity of CIWA partners such as NELSAP, ENTRO, the NBI Secretariat, and LVBC on how to integrate GESI into their projects and internal operations.

CIWA recognizes that water is a male-dominated field and that the engagement of men committed to gender equality offers a strategic approach to address the systemic and societal issues that foster gender inequality. While direct efforts to empower women are critical, results from past development projects indicate that there can be nuances to achieving impact on women’s empowerment. This can be addressed by involving supportive men as champions of women’s inclusion and empowerment through their own actions, collective engagement with other men, and support of women to bolster their confidence to voice their own needs and concerns. Male champions of gender equality can identify practical and constructive actions to shift entrenched systems of inequality and cultural norms that may be easier for other men to hear and act on.

CIWA launched the Male Champion Forum for men to work with other men to foster more gender-equitable spaces for women’s participation. In June, CIWA hosted a one-day workshop with eight East African members of the Male Champion Forum, who demonstrated a strong commitment to work with other men in water resources management to promote gender equality. The men are eager to maintain the Forum’s momentum by holding regular meetings, creating a social media platform, developing an action plan, and expanding the network to a broader group working on women’s empowerment and gender issues.

A VIEW FROM THE FIELD:

Go to [page 52](#) to learn about the launch of CIWA’s new and innovative initiative: the Male Champion Forum which aims to increase awareness about the critical role that men can play in championing gender equality.



CIWA plans to build on the East African workshop by hosting a regional seminar to raise awareness about the importance of engaging men as champions of gender equality, which will also draw on lessons learned from global efforts in other sectors that have worked with men to advance gender equality, such as the Men Engage Initiative. The seminar will also serve as a launchpad to identify additional actions that members of the Male Champion Forum can take individually and collectively. CIWA also plans to expand the Forum through to include new partnerships to bring in the experiences and voices of women in the sector.

In recognition that women are not homogeneous and that it is important to ensure that CIWA projects identify other vulnerabilities, CIWA expanded its focus on social inclusion. This includes developing a toolkit for social development experts to learn how to integrate a social inclusion lens into CIWA programming and a complementary two-pager for CIWA staff and partners. To raise awareness about this need, CIWA also produced a blog and Learning Note to capture lessons learned from similar previous efforts.

To further advance the understanding of CIWA's adoption of a gender-transformative approach, the program's GESI expert produced a paper on gender in the Nile Basin that synthesizes views of key stakeholders on the strengths and weaknesses they have experienced when applying a transformative approach to gender in their work. The paper was published in a book, "Gender Dynamics in Transboundary Water Governance: Feminist Perspectives on Water Conflict and Cooperation." CIWA communications activities highlighted the GESI work, including by sending out regular tweets and producing a podcast and two videos focusing on the importance of women's leadership in the transboundary water sector.

CIWA has created new GESI results indicators, disaggregated by sex, which will focus on capturing the number of people in CIWA-funded operations who participate in trainings on integrating GESI into their activities. While still in its pilot stage, the preliminary set of indicators to measure progress is being deployed.

CIWA is continuing to provide technical assistance on GESI to the projects it supports, including the World Bank's GW4R project in the HoA and NCCR, which have both identified gaps and possible actions to address gender issues.

“

The Male Champions Forum

provides an **enabling environment** for more women as engineers and experts in the water sector and to **get a better balance of perspectives.**

”

“

The dialogue

on transboundary water has been very limited due to the absence of women. The Male Champion program offers an **opportunity to ensure women are active participants.**

”

“

As a Male Champion,

I want to be a role model to improve the well-being of women and to advocate for their right to **participate as equals in the transboundary water sector.**

”

“

There is an issue

with **representation in the transboundary water sector.** We are often missing **important perspectives.**

”

“

The Male Champions Forum

provides an opportunity to **work together as a community** and to identify some innovative ways to tackle challenges of **gender inequality** in the transboundary water sphere.

”

Dereje Gebremichael
Formerly worked at the **Ethiopian Ministry of Water and Energy**

Richard Sangabo
Social safeguards Specialist and Gender Expert (NELSAP)

Donald Kasongi
Researcher and policy analyst, former Secretary General of the Nile Basin Discourse

Callist Tindimugaya
Water Resources Specialist, Ministry of Water and Environment in Uganda

Assefa Gudina
Gender Focal Point, Eastern Nile Technical Regional Office (ENTRO)

Quotes from the East African members of the first Male Champion Forum workshop held in June 2023.

Communications

Building on the visibility raised in previous years, the communications team promoted the CIWA program by engaging with external, CIWA, and World Bank audiences through web content, social media, newsletters, and events.

CIWA's communications work centers on increasing awareness of, and building support for, more sustainable, data-driven, community-focused, and collaborative management of transboundary waters at national, regional, and global levels. The communications effort focused on disseminating the knowledge and tools developed by the program for sustainable transboundary waters management practices and policies in Sub-Saharan Africa.

In FY23, the communications team showcased CIWA's initiatives at global events, collaborated with other World Bank programs and initiatives on transboundary management-related activities and events, and produced stories and outreach pieces emphasizing CIWA's impacts at country level. It also worked with riparian governments and partners to showcase efforts to unlock the potential for sustainable, climate-resilient growth by addressing constraints to cooperative water resources management and development.

Social media

CIWA expanded its social media presence, using Twitter for conversation and news connected to events, launches, and notable UN days. CIWA continues to maintain and grow @CIWAProgram on Twitter with daily outreach, netting a consistent uptick in new followers, which totaled 2,800 at the end of June 2023 and had a steady engagement rate. At the end of FY23, for example, @CIWAprogram garnered nearly 30,000 views over one month from a blog post and video releases on the Lake Chad Basin. In addition to @CIWAProgram, CIWA's messages and content are posted by @WorldBankWater, @BM_Afrique, @WorldBank, and @WBG_environment, which collectively have nearly four million followers. CIWA's main hashtags were #WATERCOOPERATION, #WATERSHEROES, and #WATERACTION.

Blogs and audiovisual productions

CIWA produced 14 blog posts and 'View from the Field' stories, covering all focus areas and regions. It also created more than 10 explainer videos and podcasts in English and French, including about CIWA's social inclusion perspective; groundwater-dependent ecosystemss in the Sahel region; water security in Lake Chad Basin; the protection of the Great Limpopo Transfrontier Conservation Area, the Cubango-Okavango Basin, and the riparian ecosystem of the Senegal-Mauritanian Aquifer Basin; and water quality issues in Lake Victoria Basin.

CIWA bulletin

CIWA maintains an active newsletter and mailing list with over 3,000 recipients from the donor community, partners, civil society, client governments, and the public. The quarterly newsletter features program updates and stories, notices about upcoming events and new publications, and information about transboundary waters.

CIWA website

The bilingual English/French website www.ciwaprogram.org/fr, which features an overview of the program and its goals, dedicated pages for each region's activities, and a description of the program's focus areas, has grown to include more resources and blogs, also shared on the Water Blog of the World Bank. The website is a crucial tool in CIWA's communication strategy, and it regularly updates and displays information in a user-centric design. Events, stories, and reports are shared regularly and include Learning Notes, Frameworks, and Synthesis Reports.

CIWA publications

In addition to launching its 11th annual report, CIWA shared the following publications including on its website:

- A social inclusion toolkit and its summary, "Applying a Social Inclusion Lens to the Transboundary Water Context—Cooperation in International Waters in Africa Tool"

A Learning Note: Applying a Gender Equality and Social Inclusion Lens to the Transboundary Water Context.

- A CIWA Learning Notes Series on the CIWA-funded Sahel Groundwater Initiative:

- Harnessing the Potential of Groundwater to Enhance Pastoral Productivity in the Sahel
- Uncovering the Socio-economic Potential of Groundwater-dependent Ecosystems in the Sahel
- Catalyzing Farmer-Led Irrigation Development in the Sahel from Shallow Groundwater

Knowledge management activities and Africa-based and global events

CIWA was mentioned at many events, including internal and external conference/webinars/seminars, roundtables on CIWA-supported activities, and larger conferences such as World Water Week 2022 in Stockholm ([watch](#) the recap video⁵⁶ of an interview with CIWA Program Manager Anders Jägerskog). Jägerskog gave a talk on transboundary water cooperation in the African context at a seminar of the Center for Comparative and Transnational Law—Environmental, Energy and Climate Law Cluster in the Chinese University of Hong Kong in November 2022. The CIWA communications team also covered CIWA's participation in the UN 2023 Water Conference⁵⁷ with the theme of 'Water for Sustainable Development;' World Water Day in March 2023, which focused on the objectives of the UN Secretary-General's Plan: Water Action Decade 2018-2028; virtual participation in the UN Biodiversity Conference (COP 15) in December 2022; and virtual participation in Geneva Peace Week in October–November 2022.


Building partnerships

Building partnerships and encouraging collaboration and knowledge sharing is central to CIWA's strategy and goals. CIWA activities deliver results by harnessing strategic partnerships locally and globally. In FY23, the program made several advances in this area, including by attending the Stockholm International Water Institute (SIWI) World Water Week and a high-level RBO stakeholder engagement meeting hosted by NBI:


- SIWI Water Week: Anders Jagerskog participated with other water experts from around the world in the SIWI World Water Week in August 2022 in Stockholm to discuss ways to adopt innovative measures for a water-secure future. Themes included the importance of groundwater, GESI in water management, and transboundary waters as a vehicle for socio-political and economic development and cooperation.

- CIWA co-funded (with the African Ministers' Council on Water) a high-level RBO stakeholder engagement in May 2023 in Kampala, Uganda, which was organized and hosted by NBI. Over 30 African RBOs attended to share experiences about RBO management and sustainability and to leverage opportunities to harness synergies and promote joint planning, coordination, partnerships, and implementation of Africa Water Vision 2025.


In FY23, CIWA continued to see an uptick in user engagement with its website, Twitter account, publications, and blog posts.




2,800 FOLLOWERS



as of June 2023, double the amount we had in June 2022




24k TOTAL VIEWS



on average per month on CIWA's posts

78% increase* in downloads of **CIWA RESOURCES**




46% increase* in traffic to the **CIWA WEBSITE**

*Referring to an increase between June of FY22 and June of FY23.


CIWA BULLETIN

3,000+ recipients



Donors, partners, and the public receive updates on CIWA's work in our quarterly bulletin.

22 BLOGS



published outlining CIWA projects, publications, news, and ongoing activities across Africa.

A woman wearing a grey beanie, a light blue long-sleeved shirt, and a dark red skirt is walking away from the camera on a dirt path through a field of lush green crops. The background shows more trees and a clear sky.

03

A VIEW FROM THE FIELD

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Abibata Ouattara: Access to water for women-led farming is a win for communities



Abibata Ouattara, water security specialist, Burkina Faso. ©Abibata Ouattara

Abibata Ouattara of Burkina Faso firmly believes in the value of water and women—and in their intersection.



“With water, we have health. With water, we have the financial resources. With water, we have access to better food.”

Ouattara is a water security specialist for Winrock International, a global nonprofit organization based in the United States that has projects in such areas as water security, climate change, agriculture, and resilience. She recently worked on a CIWA project to uncover the challenges of access to groundwater for irrigation by farmers in the Sahel, focusing on the constraints that women in Burkina Faso face when deploying groundwater irrigation.

She says that women encounter several major obstacles to groundwater irrigation. First, there is a lack of access to land because of socio-cultural constraints that discourage women's land ownership. Moreover, women are reluctant to invest in wells and boreholes if they do not have secure access to land. Second, there is limited access to irrigation technologies, starting with lack of information about technology and related issues. Third, there is lack of access to financial resources to buy equipment and other agricultural infrastructure.

Ouattara suggests that to overcome the lack of access to land, the government should reserve a percentage of land developed in irrigation projects for women. She also emphasizes the importance of adapting certain infrastructure to meet the needs of women, such as the design of more user-friendly means of excavation. Finally, she stresses the necessity for governments to improve women's access to grants and loans for irrigation.

Ouattara is a quality, safety, and environmental engineer who specializes in water, sanitation, and hygiene (WASH) in humanitarian contexts. She also obtained an executive master's degree in development policy and practice, with a focus on how development projects can be adapted to unstable contexts such as Burkina Faso.

Her interest in humanitarian assistance led her to found a local association to help vulnerable people, especially women and children, in need.



“There is nothing more exhilarating than serving others and, as a woman, it is always with a joyful heart that one supports other women,” says Ouattara. “In fact, there is no greater joy than that of dedicating oneself to others.”



Ouattara working in the field, Burkina Faso. ©Abibata Ouattara

Asia Namusoke: Making a difference for her Ugandan community and the climate

The Ugandan village of Ndejje, north of Kampala, is poor, has many people living with HIV/AIDS, and lacks the resources for climate-smart agriculture to sustain livelihoods and protect the environment.

Asia Mbajja Namusoke aims to change that.⁵⁸

With support from CIWA, the Nile Basin Discourse trained Namusoke and other women as Climate Change Resilience Champions two years ago. She has put her knowledge to good use ever since, developing programs to inspire and provide a lifeline to others in Ndejje and beyond.

For example, the training taught her the importance of planting trees, flowers, spices, and vegetables that are climate resilient.

“Light came into darkness” during the training, Namusoke says. “I realized that there were small actions one could do to make a difference.”

“The training to work with communities to promote sustainable agriculture was really inspiring,” says Namusoke, who also is founder of the People in Need Agency (PINA), a non-profit organization that helps HIV-positive women and youth play a key role in improving their lives and communities.

Her projects are especially empowering to women in her community, many of whom have faced gender-based violence (GBV) and are HIV-positive.

To address challenges faced by women and others, Namusoke explains, “I set up a demonstration income-generating and environment-friendly project comprising urban vegetables, rabbit-rearing, beekeeping, a waste recycling center, and a black soldier fly rearing operation for alternative animal protein and high-value crop fertilizer.” The larvae of black soldier fly insects can convert organic waste into high-quality nutrients for pet food, fish, and poultry feed and even soil fertilizer.

Twenty-eight families have now created their own vegetable gardens, 14 families are rearing rabbits, 11 are growing maggots, and 10 have set up beehive apiaries in their yards.



Asia Namusoke at work on her farm in Kampala, Uganda. ©PINA

The beauty of Namusoke’s projects is that they have a range of benefits from food security to climate change mitigation and better health outcomes.

“We work under the principle that the Sustainable Development Goals are integrated—they recognize that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability.”

A woman who makes honey from her beehives, for example, can sell the product in the local market and generate income. “This person can then keep her clinic appointment to obtain life-saving medicine because now she can afford transportation to the clinic,” Namusoke says.

“We work under the principle that the Sustainable Development Goals are integrated—they recognize that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability.”

For example, she says, “if you have food in the compound that was grown using sustainable principles, you can achieve the climate aspect of it and the food security aspect of it, too.”



“The innovation is designed to strike a balance between therapeutic and profitable goals, which are the two key pillars of our income-generating project,” she says. “Community members are engaged as waste collectors, project staff, [and] in marketing and sales, and are assisted to start project-related businesses in their homes and communities.

“This allows them to occupy their time, earn a living, learn skills, and also help with climate and environmental protection efforts,” she says.

Her community, like many throughout Africa, is ill-equipped to cope with climate shocks.

“When it rains, sometimes it floods, and then drought may occur,” she says. “We don’t have the capacity or resources to irrigate the fields,” which leaves residents vulnerable to variable and unpredictable rainfall.

At the CIWA-supported training, Namusoke learned that each community is required to have a water management committee.

She met with village leaders and convinced them to form such a committee, and it is now educating residents to stop throwing garbage into drainage systems and to remove dirty bottles and other waste from water points to prevent contamination. The committee has also placed garbage collection bins throughout the community and is encouraging people to recycle.

Namusoke hopes one day to establish regional climate change training centers.



“There is so much to learn,” Namusoke says. “Then you can really transform your community.” She adds, “Climate change resilience begins at home.”



Asia Namusoke on her farm in Kampala, Uganda. ©PINA

Eddie Riddell: Improving livelihoods in Southern Africa

The Pafuri–Sengwe Node of GLTFCA spans regions in three countries—Mozambique, South Africa, and Zimbabwe. The area is rich in bird species and big game such as elephants, and ecotourism is a major source of income.

Pafuri-Sengwe encompasses the Limpopo River, whose seasonality limits livelihoods and leads to water and food insecurity for those living and working near the river. Pafuri-Sengwe is susceptible to drought, which is expected to intensify in coming years, leaving already vulnerable communities less equipped to support their families and jeopardizing the protection of biodiversity.

The Makuleke wetlands on the South African side of the Pafuri-Sengwe Node have been designated as protected by the Ramsar Convention on Wetlands; they are named for the Makuleke Clan, an agricultural and fishing community that was forcibly removed from its land by the former apartheid government. Title to their land was restored as part of the post-apartheid restitution law, and it is now known as the Makuleke Contractual National Park, located in the northernmost part of Kruger National Park and now a jointly managed and protected area.

The GLTFCA Joint Management Board has earmarked Pafuri-Sengwe as a key socio-economic development focus area as part of its Integrated Livelihoods Diversification Strategy.

The board turned to CIWA for analysis of the extent of groundwater aquifers, above-ground water systems, water demand and usage, and water resources governance practices. The goal was to help communities be more climate-resilient and better equipped to plan for and mitigate drought, resulting in less loss of biodiversity and increased food and water security.

CIWA's work "was very insightful and even counter to our own intuition," says Dr. Eddie Riddell, who was the manager of Kruger National Park's freshwater ecosystems and integrated water resources program at the time of the assessment; he helped design and implement the Pafuri-Sengwe work in collaboration with SADRI.

For example, Dr. Riddell explains, the assumption had been that communities in the area had limited access to water because of the highly seasonal flows of the Limpopo River (no flow in the dry season) but, in fact, they generally had good access because the area is in a floodplain with sufficient replenishment of alluvial groundwater. The issue was access to potable water because of high salinity and problems with cross-border water-related supply chains, which worsened during the COVID-19 pandemic.

Some of the hand pumps have fallen into disrepair on the Mozambican side of the Pafuri-Sengwe Node, and communities there and on the Zimbabwean side face food insecurity. The South African side has somewhat more economic resilience but limited options to diversify livelihoods. CIWA's analysis suggests this can change.



An elephant in the Limpopo Basin. ©Eddie Riddell / Kruger National Park

An important component of SADRI's work was improving water resources knowledge and data management, which were outdated. The goals included generating baseline information on wetlands, groundwater, and the interaction between these surface and groundwater resources and determining the extent of water availability in aquifer, wetland, and river systems.

The team created maps to delineate the wetland systems linked to the river systems using GIS mapping and RS. SADRI also conducted a hydro-census to assess current water demand and usage and existing water governance structures and practices. It then developed country- and transboundary-specific recommendations and investment needs to build drought resilience.

"The general conclusion was that there is potential to assist communities to improve livelihoods," says Riddell, who is now the regional coordinator for the Global Environment Facility's International Waters Program in the transboundary Limpopo Basin. "Access to potable water is key and low-hanging fruit."

The SADRI study also found that by investing in climate-smart tools, there is potential to increase communities' health and well-being through improved productivity on vegetable farms.

"The stocktaking that CIWA did was extremely valuable to assist conservation managers to seek solutions for shared benefits in jointly managed protected areas," Riddell says.

Mathogonolo Mmese: An aspiring hydrogeologist in Botswana

When Mathogonolo Mmese of Gaborone, Botswana was age 16, she thought long and hard about which career to choose and decided to become a doctor.

But soon after, she realized that she didn't have a passion for medicine. She thought some more and chose hydrogeology. That decision stuck.

Today, Mmese, 25, is pursuing a master's degree in hydrogeology at the University of Botswana.

"In our country, most of the water that we drink is a little bit salty," she says. "I want to help provide not just clean water but water that tastes good."

Salty water does not plague the capital city of Gaborone. But Mmese gained first-hand knowledge about the status of water growing up in different towns in Botswana, because her mother, now retired as an immigration officer, was posted throughout the country.

Mmese received her undergraduate degree in applied geophysics from the University of Botswana.

Now, as a graduate student, she has won a Young Professionals scholarship of approximately US\$12,000 from SADC GMI to pursue fieldwork for her thesis. The scholarship will help pay for tuition and expenses during her field study, especially for data collection and processing.

"Mathogonolo Mmese is a talented and motivated young female geoscientist with limited financial resources aspiring to be a professional hydrogeologist," professors Rubeni Ranganai of the University of Botswana and Modreck Gomo of the University of the Free State wrote in her scholarship application.

Mmese's thesis is focused on the factors that control the occurrence of groundwater on the Botswana side of the Khakhea-Bray Transboundary Aquifer, which is shared by Botswana and South Africa. She plans to develop a conceptual model of the TBA using geophysical and hydrogeological data, with the ultimate goal of better management of groundwater resources.

As one of only two women among seven students in her master's degree program, Mmese is aware of the challenges faced by women in the male-dominated field.

"There is a need for you to prove that you belong there," she says. "You need to put in more work to prove that you are good at your job."

Women have one advantage, she says. "Women are responsible. So, men tend to trust women. That's the upside."



Mathogonolo Mmese during her thesis' fieldwork in Botswana. ©Mathogonolo Mmese

Mfundo Macanda: Developing climate-smart agriculture in the Eastern Cape

The eastern side of the Eastern Cape, a former homeland called Transkei during South Africa's apartheid period, is a mostly rural area in South Africa. Livestock roam freely across gently rolling hills. It is defined by its unique sights—from the herds of spotted Nguni cattle that frequent abandoned beaches to round huts belonging to the Xhosa people.

The region is one of the least developed agriculturally in the Eastern Cape and has had little overall economic growth. The area has enough water for agricultural development during the rainy season but, during the drier winters, water scarcity makes it impossible to produce crops year-round. The main crops are grains and vegetables—primarily for household consumption and sometimes for selling surpluses to neighbors.

For farmers and the agricultural sector to flourish and to increase food security and access to markets, farmers need to be supported with systems that ensure continuous production of high-quality produce. Farmers identify lack of year-round water availability, which is exacerbated by climate change, as their biggest limiting factor.

"For people to produce optimally, water—and water storage and irrigation—is the key," says Mfundo Macanda, director of livestock production, research, and development in the Eastern Cape Department of Rural Development and Agrarian Reform (DRDAR).

"We need climate-smart agriculture" during winter's dry conditions, Macanda says.

To develop inclusive and sustainable agriculture, the Eastern Cape Provincial Government turned to the World Bank and SADRI, a CIWA technical assistance that addressed cross-border drought risks, improved cooperation, and created a holistic vision of drought-risk management throughout Southern Africa until the project's closing in June 2023.

The government and SADRI team created a concept for the development of rainwater harvesting for homesteads. They also identified potential investors who could drive development of outgrower arrangements with small-scale and homestead producers. The partnership could be supported by the IFC.



An example of a climate-smart agriculture field developed in Eastern Cape, South Africa. ©Mfundo Macanda

Macanda explains that, as a result of the work with SADRI, the provincial government is starting a three-year pilot program to introduce a micro-scale irrigation system for the production of high-value horticultural crops, first in households, then hopefully expanding it so people can supply fresh produce to local schools and hospitals, and finally scaling up to help farmers sell their crops in markets.

The goal of the pilot is to ensure that households and farmers can access water year-round through rainwater harvesting techniques and runoff, which is stored for irrigation of fields and crop production in the winter.

DRDAR is currently identifying villages and individual households to participate in the pilot.

The next step is developing the water storage system and then providing irrigation infrastructure to the fields for about 30 households selected for the pilot. The government will also provide them with free seedlings of trees and vegetables.

Says Macanda, "The farmers need economic support so they have a better chance of success."

Male Champion Forum: Who has the power to make decisions?"

"Who has the power to make decisions?"

Everyone in attendance knew the answer –men.

"Women are seen as being in the rear seat," said Donald Kasongi, a researcher and policy analyst from Tanzania who has worked for years to mainstream gender in transboundary water resources management, including for eight years as the Secretary General of the CIWA-supported Nile Basin Discourse.

Kasongi was participating in a virtual Male Champion Forum workshop in June 2023, which was organized by CIWA as part of its work to bring a transformative gender lens to water resources management. The participants were chosen for their commitment to, and experience with, promoting gender equality.

CIWA has designed a pilot program to foster a cadre of men to spur changes in social norms and values on gender in transboundary water management and development, a sector that is dominated by men and strongly influenced by patriarchal norms and values.

CIWA believes that engaging men is key to transformative change and that working directly with pioneering men can help overcome male resistance to women having equal roles.

"The issue is representation" of women in the water sector, says Assefa Gudina, ENTRO's gender focal point.

Dereje Gebremichael agrees. "The water sector is male dominated. It starts from the attitude of (male) leadership in RBOs," says Gebremichael, a senior grants acquisition and planning officer for the Ethiopian Orthodox Church Development and Inter-church Aid Commission who formerly worked for Ethiopia's Ministry of Water and Energy.

In the context of patriarchal cultural and social norms, women are stereotyped as being only water users rather than also as people who should have autonomy to make decisions about water use and management.

CIWA's Male Champion Forum has the following goals:

- Increase awareness about the critical role that men can play in championing gender equality in the transboundary water context.
- Identify actions and initiatives that Male Champions can take to advance gender equality in transboundary water institutions.
- Facilitate opportunities for Male Champions to take individual and collective action to promote opportunities for women to play a greater role in decision making in transboundary water institutions.
- Improve representation of women in decision making.

Along with the issue of representation, Gudina says, is the need for more women to enter education programs in water resources management. He also says that there should be a stronger professional transboundary water network for women to advance their careers.

The men shared their reasons for joining the Male Champion Forum.

Gebremichael candidly acknowledges that the promotion of gender equality has some benefits for men.

"I want to engage in the Male Champion Forum to empower women in the work environment. They will help me share the work and projects."

And, he says, gender equality strengthens communities. "The community always gives men all the responsibilities in life," he says. "If I am a male champion working for gender justice, it makes the community a more powerful one. So, let's empower men to work toward gender equality."

Daniel Asrat, a monitoring and evaluation consultant in the Ethiopian Ministry of Water and Energy, says, "As a Male Champion, I represent my three daughters. I represent my wife. I represent my sisters, and I represent my female neighbors."

The participants in the workshop agreed on next steps, including holding monthly meetings, developing a plan of action for the initiative, launching a social media platform, and working to expand the network.



CIWA Male Champions who participated to the pilot workshop in June 2023. ©CIWA

04 LOOKING AHEAD

Looking Ahead

As Sub-Saharan Africa grapples with political unrest, violence, and fragility and as climate change wreaks havoc, CIWA's efforts to foster cooperation over, and management of, transboundary waters to mitigate climate impacts and ethnic and cross-border tensions remain critical to economic development and peace on the continent. CIWA is at the core of the World Bank's new strategic direction focusing on sustainability, resilience to shocks, and inclusion to achieve its mission and more effectively deliver GPGs. Transboundary water management is a regional public good and a prerequisite for the achievement of several other key GPGs, including climate resilience, conflict prevention, and biodiversity preservation. As a very well-functioning Trust Fund, CIWA aims to further expand and scale its work to help address these global challenges and further increase its impact in the years to come.

Since its inception, CIWA has worked to address the causes and consequences of climate change on transboundary water management and regional water security. In the new FY, the program will conduct a strategic assessment and planning exercise to identify the opportunities, value proposition, and risks for advancing CIWA's transboundary water resources cooperation and development through a climate change adaptation and mitigation lens and suggest key areas for future engagement.

In 2023, World Bank launched the US\$382.4 million RCRP for Eastern and Southern Africa, which is working to improve the management of water-related disasters in those regions and to enhance prevention of, response to, and recovery from climate crises. CIWA will launch a new grant to complement RCRP that will support deepened regional dialogue and strengthened knowledge for sustainable planning and management of transboundary water resources in participating countries (Phase 1 includes South Sudan, Madagascar, Comoros, and Mozambique). This Bank-executed CIWA operation will include identifying investment priorities that can be financed under RCRP and will support reengagement in key Southern Africa transboundary basins like the Okavango and Zambezi.

CIWA will continue to make progress across its strategic areas of work. It will develop a Biodiversity Framework to take a more structured, integrated approach to embedding biodiversity and conservation considerations into the design and implementation of program activities and initiatives. It will also make public its FCV Framework that was developed this year to help fragile countries facing multiple challenges.

CIWA will build out its new Male Champion Forum following a successful pilot in East Africa in this fiscal year. Activities may include developing an action plan to advance the initiative, holding monthly meetings focused on the implementation of gender-related actions, conducting advocacy and outreach to promote the Forum and expand its membership, and launching a social media platform.

Most of CIWA's engagements in the region are nearing completion. Of course, it has projects in the pipeline that need funding. CIWA has accomplished much with limited resources over the years but cannot continue to make progress without more resources. As the World Bank said in a recently published blog,⁵⁹ "Investing in water supports people, the planet, and the economy—it is a critical accelerator for achieving the SDGs. Globally, investment needs for the water sector exceed \$1.37 trillion and must increase six-fold from current levels to meet SDG 6 (clean water and sanitation for all) by 2030. Yet water currently attracts less than 2 percent of public spending and a similarly low level of private investment in low- and middle-income countries."

CIWA is pleased that the United Kingdom's Foreign, Commonwealth and Development Office has decided to make a new UK£8million contribution to the program. But to address the vast needs across the continent, much more must be done, and CIWA will continue to fundraise this year and beyond—and seek an extension of the Trust Fund after 2026—to benefit the people of Africa.



Woman washing up in Lake Chad. ©Eskinder Debebe

⁵⁹ <https://www.ciwaprogram.org/blog/sowing-the-seeds-of-change-to-solve-the-water-crisis/>



05 ANNEXES

Wageia fishermen are working on and checking the wooden net in middle of the rapids of Stanley Falls, Democratic Republic of Congo. ©gguenterguni

Annexes

Annex 1—Allocations

Annex 1 describes the CIWA portfolio in terms of the proportion of its allocations¹ according to grant types, partner types, engagements (geographical), and primary outcomes. The key points are:

- 1 CIWA grant allocations by grant type largely exhibit a consistent ~70-75 percent of the portfolio going to RETFs.
- 2 Allocations to support regional RBOs remain high but decreased 10 percent (from 74 to 64 percent of the cumulative allocation). As noted last year, the decrease in RBO grants is matched by a small trend of CIWA supporting national institutions, such as in Somalia and South Sudan, and RECs (SADC and IGAD).
- 3 The Nile River Basin remains the major beneficiary of CIWA allocations. Respective share of allocations by basin remains consistent.
- 4 As in last FY, CIWA has pivoted to smaller and nature-based infrastructure investments, which is borne out by the trend in primary outcomes.

Figure A1.1 shows that RETF grants still dominate the portfolio. The two active RETF grants are the NCCR and SADC Groundwater Management Phase 2 projects. RETF grants are 71 percent of the cumulative portfolio, roughly the same as in FY22. Grants for preparation and supervision remain near 6 percent.

Figure A1.2 shows that CIWA’s cumulative portfolio includes a wide diversity of regional institutions. The majority (64 percent) of RETF clients and technical assistance partners are regional RBOs. The breakdown is in line with CIWA’s intention to provide long-term sustained support to regional RBOs while also diversifying support to new types of partners. This year, CIWA added the Buzi, Pungwe, and Save (BUPUSA) Watercourse Commission, shared by Mozambique and Zimbabwe.

Figure A1.1 Allocations by Grant Type

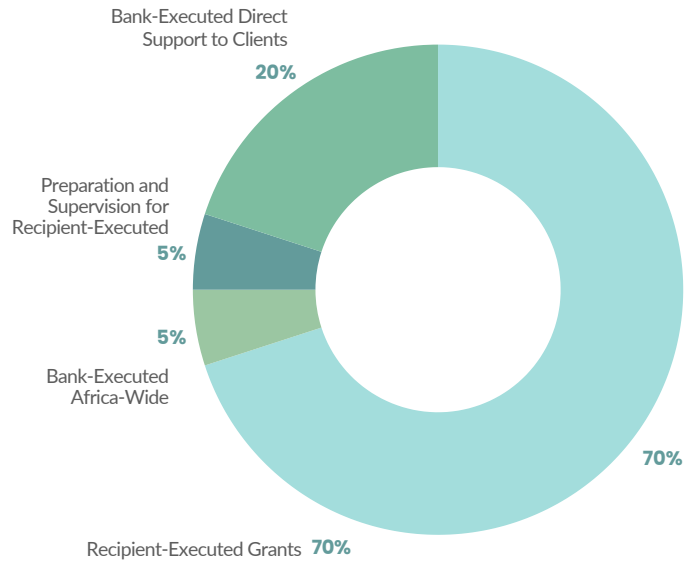


Figure A1.2 Allocations by Partner Type

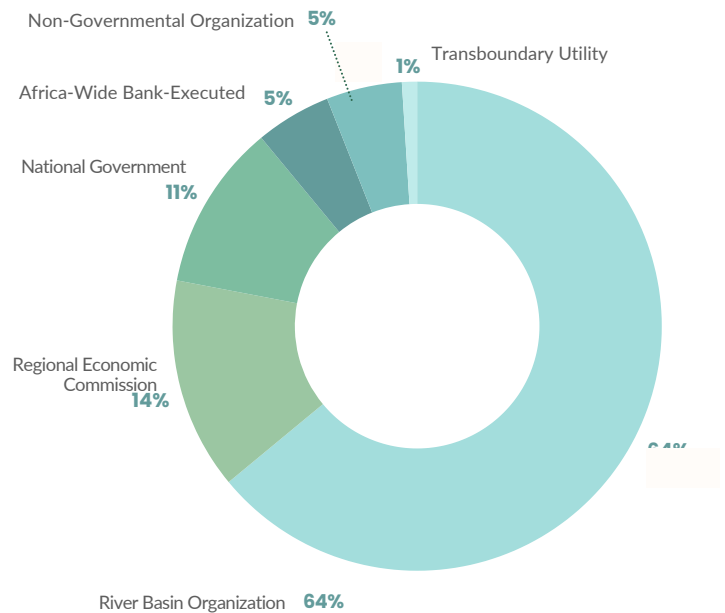


Figure A1.3 includes all engagements. CIWA has engagements in all Sub-Saharan Africa regions: the Nile Basin share of engagements is roughly 48 percent, the Southern Africa portfolio is at 22 percent, HoA allocations stayed at 11 percent, and West and Central Africa allocations are 14 percent (the remaining going to Africa-wide technical assistance). CIWA is currently actively rebuilding the priority basin engagements as funds become available. Note that the pipeline grant for RCRP is currently designated as Africa-wide Technical Assistance.

¹ Every year’s allocation analysis is cumulative except where explicitly described otherwise and include pipeline allocations, which are listed in Table A4.5 of the respective CIWA Annual Report. Caveats are present in the longitudinal allocation data because changes can occur in the pipeline (although endorsed by the Advisory Council) and major country context shifts can be influential as well.

Figure A1.3 Allocation by engagement

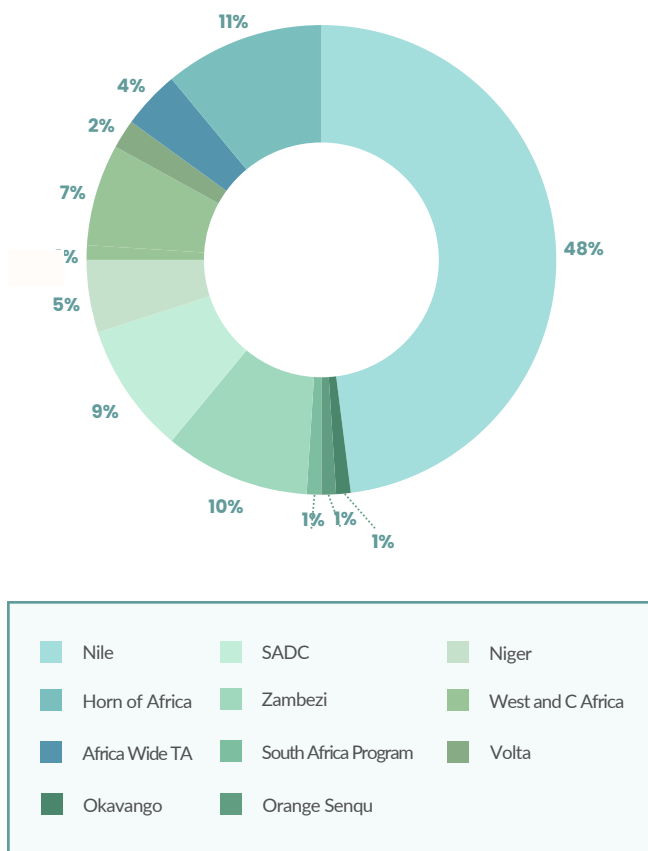
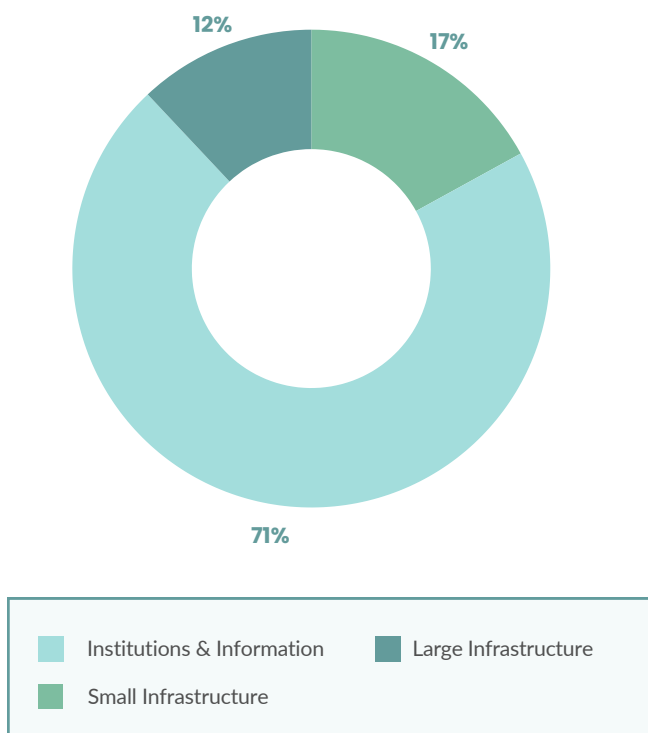


Figure A1.4 shows the cumulative primary outcome of CIWA allocations (including pipeline). CIWA allocations to large infrastructure stayed at 12 percent. Small and nature-based investments increased from 14 to 17 percent and institutional and information systems support is now at 71 percent.

Annex 2—Results Framework

CIWA reports against its Results Framework targets each year in its Annual Report. This provides both quantitative and qualitative reporting on achievements and results from CIWA-funded activities. While indicator results and targets are broadly cumulative, qualitative narratives are presented in the main report, while Annex 2 explains how specific projects contribute to achieving targets. The PDO indicators and the Intermediate Results areas are defined at the program level and are calculated as an aggregate of outcomes from projects funded by CIWA. Progress against the PDO (to strengthen the cooperative management and development of international waters in Sub-Saharan Africa to facilitate sustainable climate-resilient growth) is measured by (i) the value of investments leveraged and (ii) the number of people expected to directly benefit from influenced investments (both potential and mobilized). Table A2.1 lists the potential investment projects influenced by the program, where preparation studies enable estimations of investment values and project beneficiaries. Table A2.2 lists those investment projects influenced by CIWA that have thus far mobilized resources. Investments are tracked cumulatively and updated annually. CIWA provides targets for the subsequent year based on the known pipeline. Aggregate FY23 values and FY24 targets are presented in Table A2.3.

Figure A1.4 Allocations by Primary Outcome (2023)



This year's Results Framework includes three new indicators based on the results of the last Midterm Evaluation:

- Number of stakeholders (including communities and private sector) trained in improved biodiversity conservation or natural resource management activities.
- Number of women in high- or medium-skilled and/or management positions trained.
- World Bank operations informed by CIWA grants.

Overall, as was true for FY22, CIWA exceeds its target for the number of beneficiaries from influenced investments but is short of targets for the leveraged value of investments. Of note is that the estimate of the number of beneficiaries from the SMAB pre-feasibility investment was much larger than anticipated initially in FY22 (as the scope has expanded). Moreover, as previous Annual Reports speculated, the ratio of the number of beneficiaries to dollar value of investments for nature-based or hybrid water investments may be significantly different than for large dams, which was CIWA's previous investment emphasis. The current trend appears to be that adding CIWA-influenced groundwater investments to the portfolio has a larger ratio value than large dams. This is in line with CIWA's expectation and, furthermore, it is possible that scaling up is more favorable for groundwater investments than for built surface storage.

Table A2.1. Potential Investments Influenced by CIWA

POTENTIAL INVESTMENT	CIWA'S ROLE	ESTIMATED CURRENT INVESTMENT VALUE (US\$ BILLIONS)	ESTIMATED NUMBER OF POTENTIAL BENEFICIARIES (MILLIONS)	ANTICIPATED BENEFITS
Sahel Boreholes and Wells investment ²	Added 2022; Sahel Groundwater Initiative. Influenced PRAPS2 project investment.	0.008	12	Not yet available
Senegal-Mauritania Aquifer Basin investment ³	Added 2022; Sahel Groundwater Initiative	0.210	36.6	Not yet available
Merti aquifer pilot project (Kenya and Somalia)	Provided feasibility study; HOA Groundwater Initiative (FY21)	0.00478	0.0304	Strengthened resilience and economic development.
Khakea-transboundary aquifer (Botswana and South Africa)	Management plans provided. SADRI project (FY21)	Not yet available	Not yet available	Improved biodiversity protection and sustainable groundwater management.
Nile Basin Investments (14)	Supported NBI through NCORE and Support Program to facilitate cooperative activities such as improved IWRM, and the identification and preparation of regionally significant cooperative investments	6.936	7	Increased water supply, increased power generation, improved watershed management, irrigation development
Lesotho Highlands Botswana Water Transfer	Financing study to explore costs and benefits of water transfer and incentivize cooperation	0.8	2	Increased water supply, additional revenues
Cubango-Okavango Livelihood Enhancement Program	Support for the MultiSector Investment Opportunities Analysis used to develop long-term investment and livelihood improvement programs. Ongoing support for developing the next phase following MSIOA	0.9	Not yet available	Increased income, access to water, sanitation and sustainable energy, actions to address hunger and disease, and promotion of gender equality, education, and environmental sustainability
Luapula Sub-basin Investments	Exploring potential cooperative legal and institutional arrangements for a future Luapula River Authority. Updated in FY21.	2.17	8.4 ⁴	Increased power generation
TOTAL		US\$11.03 billion	54 million people	

^{2,3} Updated 2023⁴ The number of beneficiaries is based on the projected production of 4,420 GWh/yr mean annual generation and based on average consumption in SSA and domestic demand around 35%.

Table A2.2. Mobilized⁵ Investments Influenced by CIWA

MOBILIZED INVESTMENT	CIWA'S ROLE	ESTIMATED CURRENT INVESTMENT VALUE (US\$ BILLIONS)	ESTIMATED NUMBER OF POTENTIAL BENEFICIARIES (MILLIONS)	ANTICIPATED BENEFITS
Niger Basin Climate Resilience Investment Project	Conducted technical and political consultations to develop investment plan	0.2	4.0	Rural livelihoods, early-warning and climate information systems, climate resilience
Kandadji Dam	Supported analytical study of resettlement best practices	1.0	1.0	Increased power generation, irrigation development, job creation
Kariba Dam	Produced studies on rehabilitation of the dam, which led to decision to invest in safety and reliability improvements	0.294	3.0	Increased power generation, reduced risk, and avoided disaster
Batoka Gorge HES	Analyzed financial implications of the investment and facilitated negotiations to review findings and encourage renewal of project. Additional engineering studies and investment preparation	4.0	6.0	Increased power generation
Lake Chad Recovery Project (building on the Lake Chad Development and Climate Resilience Action Plan)	Support for development of Action Plan to execute the investments within climate resilience project	0.17	0.213	Rural livelihoods, climate resilience
Lake Chad Basin Sustainable Development Program (PRODEBALT)	Provide project study and analytics	0.021 total (0.0094 from WB)	0.022	200 rural livelihoods microprojects; improved WRM
Biosphere and Heritage of Lake Chad (BIOPALT)	Provide project study and analytics	0.0065	3.0	Biodiversity and ecosystem remediation
SADC GMI phase 1 Subgrants (9)	Provided Transboundary Diagnostic Analysis and Joint Strategic Action Planning and convened stakeholders	0.0014	0.155	Nine investments in eight countries. Aquifer utilization; boreholes, pumps, and monitoring equipment installation; water storage
Nile Basin Investments (7)	Pre-feasibility (reconnaissance assessment) of project profile and coordinated resource mobilization, institutional support, and/or facilitation of stakeholder engagement	0.648	2.07	Hydrological and meteorological information; water storage; irrigation; power generation; fisheries
TOTAL		US\$6.34 billion	19.46 million people	

⁵ Mobilized refers to all planned and actual investment financing that is incorporated into a formal and public or verifiable financial planning process, whereas potential investments are those that have had feasibility or pre-feasibility studies completed but which are not yet included in verifiable financial planning processes. CIWA may influence a project by: facilitation of investment dialogue, project scoping or identification, any stage of project preparation or contribution to an analysis associated with that stage, transaction negotiation, and/or resource mobilization.

Program Development Objective (PDO):

To strengthen the cooperative management and development of international waters in Sub-Saharan Africa to facilitate sustainable climate-resilient growth.

PDO Indicator 1: US dollar financing mobilized for cooperative management and development of international waters projects supported by CIWA

FY23 Target: US\$14 billion finance for cooperative management and development of potential transboundary waters investments influenced by CIWA; US\$7 billion finance for cooperative management and development of mobilized transboundary waters investments influenced by CIWA.

FY23 Actual:

- **Total**—\$17.37 billion
- **Potential**—\$11.03 billion
- **Mobilized**—\$6.34 billion

While there was no change to the mobilized investments influenced by CIWA, of the potential investments, the Sahel investments influenced by the Sahel Groundwater Initiative were updated. Feasibility studies for other investments influenced by CIWA are still in progress, and, therefore, these values are an underestimate.

PDO Indicator 2: Number of people directly benefiting from improved water resources management and development in target basins through projects supported by CIWA

FY23 Target: 40 million people will directly benefit from improved water resources management and development projects influenced by CIWA.

FY23 Actual:

- **Total**—73.5 million people
- **Potential**—54.0 million
- **Mobilized**—19.46 million

As for PDO indicator 1, there was no change to the mobilized investments influenced by CIWA, but of the potential investments, the Sahel investments influenced by the Sahel Groundwater Initiative were updated to 78 million people (as against a revised target of over 36 million people, versus the original target of 17 million beneficiaries from potential SMAB investments).

Intermediate Result 1. Regional Cooperation and Integration Strengthened

IR Indicator 1: Number of relevant transboundary institutions strengthened to improve regional cooperation

FY23 Target: 12 transboundary institutions in at least 5 basins have strengthened regional cooperation and integration.

FY23 Actual: 20 relevant regional institutions:

BUPUSA Watercourse Commission, CUVECOM, ECOWAS, GLTFCA Joint Management Board, IGAD, LCBC, LVBC, LIMCOM, NBA, NBI, NBD, OKACOM, ORASECOM, Pafuri-Sengwe Joint Park Management Committee, SADC-Secretariat, SADC-GMI, SAPP, VBA, ZAMCOM, and ZRA have had projects or activities in operation since CIWA began. In FY23, SADC-GMI phase 2 project added the BUPUSA Watercourse Commission.

These institutions work in the Nile River Basin, Lake Victoria Basin, Lake Chad Basin, and groundwater basins in Southern Africa and West and Central Africa.

IR Indicator 2: Number of strategic analyses and knowledge products used to illustrate the evidence base for cooperation, needs, and challenges.

FY23 Target: 20 new strategic analyses (SAs) used to illustrate the evidence base for cooperation

FY23 Actual: 128 SAs have been delivered, cumulatively; 18 in FY23. The cumulative total of the previous year was 110 SAs that illustrated the evidence base for cooperation by providing scenarios for climate resilience, benefits of legal harmonization, groundwater resources, regional flood and drought awareness, power production, and other issues. For a comprehensive list of CIWA supported SAs, please refer to the CIWA website.⁶

From SADRI—The following are the new SAs delivered in FY23:

- **SADRI Cities Urban Drought TTL Toolkit.**

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099105212232225118/p1748560abad2a0209f20042479c1ffb9f>

- **Analytical Work to Fill Knowledge Gaps in Water Production, Use, and Governance in the GLTFCA Pafuri-Sengwe Node**

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099072523113599042/p1748710408cf600c0927103b20d011d3d4>

⁶ <https://www.ciwaprogram.org/resources/>

- **Land Use Suitability and Hydrological Assessment for Irrigated Agriculture in Eastern Cape Province.**

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099072523113536148/p174871050af12050b8c507a384e3b476c>

- **Technical Note on Homestead Farm-ponds for Micro-scale Irrigation,**

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099072523113560138/p1748711df0f8bf819eea1419419789121d0ed447342>

- **Watershed Investment Opportunities in Eastern Cape Province.**

<https://documents1.worldbank.org/curated/en/099072523113529007/pdf/P17487109c20f20a20b0af0a9b7ddb80703.pdf>

- **Watershed Investments for the Upper Umzimvubu Catchment.**

<https://documents1.worldbank.org/curated/en/099072523113535540/pdf/P1748710b9a8010509e2504b4ce0fc05c3.pdf>

- **The Role of Strategic Grain Reserves in Enhancing Food Security in Zambia and Zimbabwe.**

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/72981162427553286/the-role-of-strategic-grain-reserves-in-enhancing-food-security-in-zambia-and-zimbabwe>

From Lake Chad Transboundary Water Security

- The role of Civil Society Organizations (CSOs) in the water sector in Lake Chad Basin
- Renforcement du réseau d'observation du Lac Tchad et de sa gestion
- Climate, Water, and Conflict: Lake Chad Water Security Resilience Assessment

From Nile Cooperation for Climate Resilience:

- Quarterly NBI Technical Bulletins and Drought Monitoring and Forecasting Drought Bulletins
- NBI Capacity Building Strategy
- Report on Leveraging NBI Platforms for Cooperation (Awaiting adoption by governance)
- Ethiopia Investment Benefits from the Nile Basin Cooperation:
 - <https://www.nilebasin.org/nelsap/index.php/en/media-items/press-releases/105-june-2022-ethiopia-investment-benefits-from-nbi-cooperation/file>
- South Sudan Investment Benefits from the Nile Basin Cooperation
 - <https://www.nilebasin.org/nelsap/index.php/en/media-items/press-releases/105-june-2022-ethiopia-investment-benefits-from-nbi-cooperation/file>

- The Sudan Investment Benefits from the Nile Basin Cooperation

<https://www.nilebasin.org/nelsap/index.php/en/media-items/press-releases/115-sudan-benefits-from-the-nile-basin-cooperation-fin/file>

- DR Congo Investment Benefits from the Nile Basin Cooperation

<https://www.nilebasin.org/nelsap/index.php/en/media-items/press-releases/116-dr-congo-investment-benefits-from-nile-basin-cooperation-english/file>

- Eastern Nile Flood Early-Warning and National Flood Impact Assessment Reports

Intermediate Result 2. Water Resources Management Strengthened

IR Indicator 3: Number of relevant transboundary institutions using improved analytical tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination

FY23 Target: 11 institutions in at least five basins using improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination.

FY23 Actual: Cumulatively, 13 relevant institutions—ECOWAS, IGAD, GLTFCA Joint Management Board, LCBC, LVBC, NBA, NBI, NBD, OKACOM, Pafuri-Sengwe Joint Park Management Committee, SADC-GMI, SAPP, and ZRA have/had projects in operation that contribute to using improved analytical tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment.

In FY23, 6 regional institutions were using improved analytical tools, knowledge products, data, forecasting, and/or data capacity with CIWA's support—IGAD, GLTFCA Joint Management Board, LVBC, NBI, Pafuri-Sengwe Joint Park Management Committee, and SADC-GMI.

IR Indicator 4: Number of stakeholders (including in communities and private sector) trained in improved biodiversity conservation or natural resource management activities.

This indicator is introduced in this Annual Report. Currently no operation has relevant results. In this first reporting, there is no target, but rather, the baseline is established.

FY23 Target: N/A
FY23 Actual: 0

Intermediate Result 3. Water Resources Development Strengthened

IR Indicator 5: Number of investment opportunities with regional benefits that have been advanced through CIWA support

FY23 Target: 46 investment opportunities with regional benefits that have been advanced through CIWA support.

FY23 Actual: 44 investment projects are being advanced (44 reported previously). CIWA operations have influenced investment opportunities in the Nile Basin, the Sahel, HoA, SADC, and others. New groundwater investments in the Sahel were added in FY22 (see Tables 1 and 2 in this Annex), however, no new additions or subtractions were made in FY23.

IR Indicator 6: Design or preparation of new World Bank operations that were informed by CIWA activities.

FY23 Target: N/A

FY23 Actual:

CIWA OPERATION	INFLUENCED WORLD BANK OPERATION
NCORE (P130694), NCCR (P172848)	Regional Climate Resilience Program for Eastern and Southern Africa (P180171); \$384m
SADRI (P173007)	Regional Climate Resilience Program for Eastern and Southern Africa (P180171); \$384m
Horn of Africa-Groundwater Initiative (P169078), Strengthening Resilience in the HOA (P172358), Support to transboundary WRM (P167749)	Horn of Africa—Groundwater for Resilience Project (P174867); \$385m / Untapping Resilience (P178786); \$5m

CIWA OPERATION	INFLUENCED WORLD BANK OPERATION
Great Lakes Water Quality (P172554), NCORE (P130694)	Promoting Livable and Productive Lake Victoria Basin Communities through Lake Wide Inclusive Sanitation (P179977); \$150k
Niger River Basin Management Project (P149714)	Kandadji Project (P130174); \$408m
NCORE (P130694), Engaging Civil Society for Social and Climate Resilience in the Nile (P132448)	Regional Rusumo Falls Hydroelectric Project (P075941); \$347m
P143546 Zambezi River Basin Management Project, Zambezi River Basin Development Project (P133380)	Kariba Dam Rehabilitation Project (P146515); \$95m
NCORE (P130694)	Irrigation for Climate Resilience Project (ICRP) (P163836); \$170m
Okavango Multi-Sector Investment Opportunity Analysis (P150383)	RECLIMA (P177004); \$300m
Untapping Resilience (P178786)	HoA Groundwater for Resilience phase 2 (P179833); \$70m
Sustainable Groundwater Management in SADC Member States (P127086)	Sustainable Groundwater Management in SADC Member States Project Phase 2 (P175355); \$9m
Lake Chad Dialogue (P144568)	Lake Chad Transboundary Water Security (P176378); \$1m

CIWA OPERATION	INFLUENCED WORLD BANK OPERATION
Lake Chad Dialogue (P144568)	(P161706); \$170m
Improving Water Resources Management in West and Central Sahel (P173152)	Burkina Faso Water Security Project (P177094); \$150m
Improving Water Resources Management in West and Central Sahel (P173152)	Western Sahel Water Security Initiative (P179448); \$300m
Improving Water Resources Management in West and Central Sahel (P173152)	Cote d'Ivoire Water Security and Sanitation Support Project (P177118); \$250m
Sahel Groundwater Initiative (P175105)	Niger Integrated Water Security Platform Project (Niger-IWSP) (P174414); \$400m
Sahel Groundwater Initiative (P175105)	First Resilient Growth and Capital Building DPF (P178423); \$375m
Sahel Groundwater Initiative (P175105)	Sahel Irrigation Initiative Support Project (P154482); \$176m
Sahel Groundwater Initiative (P175105)	Regional Sahel Pastoralism Support Project [PRAPS] ² (P173197); \$4m

IR Indicator 7: Number of relevant transboundary institutions with an improved approach to sustainable⁷ investment planning and bankable investment preparation

FY23 Target: Six relevant transboundary institutions with an improved approach to sustainable investment planning and bankable investment preparation.

FY23 Actual: Cumulatively, 10 regional institutions (IGAD, LCBC, NBA, NBI, Pafuri-Sengwe Joint Park Management Committee, GLTFCA Joint Management Board, SADC Secretariat, SADC-GMI, SAPP, and ZRA) have projects in operation that contribute to improving the approach to sustainable investment planning and bankable investment preparation. In FY23, CIWA supported NBI, LVBC, LCBC, SADC-GMI, Pafuri-Sengwe Joint Park Management Committee, and GLTFCA Joint Management Board in sustainable investment planning.

Intermediate Result 4. Stakeholder Engagement and Coordination Strengthened

IR Indicator 8: Number of basins with improved engagement of civil society, private sector, and academia; percentage of engagements where improved stakeholder engagement explicitly supports the incorporation of gender issues into the design and implementation of water management and development activities.

FY23 Target: Seven basins with improved engagement with civil society, private sector, and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity

FY23 Actual: Over 8 basins (Great Limpopo Transfrontier Conservation Area, Limpopo River, Merti Aquifer, Nile River, Niger River, Volta River, Lake Chad Basin, and Zambezi River), have projects in operation that contribute to strengthening stakeholder engagement and coordination. In FY23, SADRI added the Great Kei, Tsitsa, Mbashe, Mthatha, Umzimvubu, and Mtamvuna river sub-basins in South Africa. Untapping Resilience added the groundwater basins in the HoA borderlands. The Pafuri-Sengwe Joint Park Management Committee, GLTFCA Joint Management Board, NBA, NBI, NBD, SAPP, ZRA, and VBA, have/had explicit communication, stakeholder engagement, gender equality, and/or other strategies that aim to improve gender equality through mainstreaming women's empowerment into all water management, capacity building, training, and development activities.

IR Indicator 9: Number of basins with increased water resources management and development information in the public domain.

FY23 Target: Six basins with increased information in the public domain.

FY23 Actual: CIWA's engagements in 6 basins—the Nile, Niger, Lake Chad, Lake Victoria, SADC, and Zambezi basins—have contributed to increased water resources management, climate data, and water development information in the public domain. SADC sub-basins include the Great Kei, Mbashe, Mthatha, Umzimvubu, and Mtamvuna river basins.

IR Indicator 10: Number of women in high- or medium-skilled and/or management positions trained

This indicator is introduced in this Annual Report. Currently no operation has relevant results. In this first reporting, there is no target, but rather, the baseline is established.

FY23 Target: N/A

FY23 Actual: 113 women in high- or medium-skilled and/or management positions participated in training. Untapping Resilience and NCCR contributed to these results in FY23.

Table A2.3 CIWA'S Results Framework and Monitoring—Updated September 2023

IMPACT: STRENGTHEN SUSTAINABLE CLIMATE-RESILIENT GROWTH IN SUB-SAHARAN AFRICA									
INDICATOR	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	
Program Development Objective: To strengthen cooperative management and development of international waters in Sub-Saharan Africa to aid sustainable climate-resilient growth.									
i) US\$ investment finance for cooperative management and development of international water resources projects influenced by CIWA Baseline: \$0 billion (value of projects influenced by CIWA)	TARGET								
	Target: \$9 billion (value of potential projects influenced by CIWA)	Target: \$9 billion (value of potential projects influenced by CIWA)	Target: \$10 billion (value of potential projects influenced by CIWA)	Target: \$10 billion (value of potential projects influenced by CIWA)	Target: US\$12 billion investment finance for cooperative management and development of international waters projects influenced by CIWA	Target: \$14 billion (value of potential projects influenced by CIWA) \$7 billion mobilized investments influenced	Target: \$14 billion (value of potential projects influenced by CIWA) \$7 billion mobilized investments influenced	Target: \$14 billion (value of potential projects influenced by CIWA) \$7 billion mobilized investments influenced	Target: \$14 billion (value of potential projects influenced by CIWA) \$7 billion mobilized investments influenced
	ACHIEVEMENT								
	Achievement: \$7.9 billion potential investments influenced \$5.0 billion mobilized investments influenced	Achievement: \$10.6 billion potential investments influenced \$6.4 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced \$6.2 billion mobilized investments influenced	Achievement: \$10.5 billion potential investments influenced \$6.34 billion mobilized investments influenced	Achievement: \$11.7 billion potential investments influenced \$6.34 billion mobilized investments influenced	Achievement: \$11.7 billion potential investments influenced \$6.34 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced \$6.34 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced \$6.34 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced \$6.34 billion mobilized investments influenced
INDICATOR	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	
ii) Number of people who will directly benefit from improved water resources management and development in target basins through projects supported by CIWA Baseline: 0 people directly benefiting	TARGET								
	Target: 120 million (potential direct beneficiaries of projects influenced by CIWA)	Target: 30 million (potential direct beneficiaries of projects influenced by CIWA)	Target: 40 million (potential direct beneficiaries of projects influenced by CIWA)	Target: 50 million (potential direct beneficiaries of projects influenced by CIWA)	Target: 30 million people will directly benefit from improved water resources management and development projects influenced by CIWA	Target: 35 million people will directly benefit from improved water resources management and development projects influenced by CIWA	Target: 40 million people will directly benefit from improved water resources management and development projects influenced by CIWA	Target: 45 million people will directly benefit from improved water resources management and development projects influenced by CIWA	Target: 45 million people will directly benefit from improved water resources management and development projects influenced by CIWA
	ACHIEVEMENT								
	Achievement: 41.2 million potential direct beneficiaries; 11.5 million direct beneficiaries of mobilized investments influenced	Achievement: 4.7 million potential direct beneficiaries; 12.15 million direct beneficiaries of mobilized investments influenced	Achievement: 10.8 million potential direct beneficiaries; 16.1 million direct beneficiaries of mobilized investments influenced	Achievement: 9.5 million potential direct beneficiaries; 19.46 million direct beneficiaries of mobilized investments influenced	Achievement: 17.4 million beneficiaries in potential investments; 19.46 million beneficiaries of mobilized investments influenced	Achievement: 34.4 million beneficiaries in potential investments; 19.46 million beneficiaries of mobilized investments influenced	Achievement: 78 million beneficiaries in potential investments; 19.46 million beneficiaries of mobilized investments influenced	Achievement: 78 million beneficiaries in potential investments; 19.46 million beneficiaries of mobilized investments influenced	Achievement: 78 million beneficiaries in potential investments; 19.46 million beneficiaries of mobilized investments influenced

INDICATOR	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	
Intermediate Result 1. Regional cooperation and integration strengthened									
i) Number of relevant transboundary institutions strengthened to improve regional cooperation Baseline: 0 institutions strengthened	TARGET								
	Target: 8 relevant institutions with projects or activities in operation	Target: 8 relevant institutions with projects or activities in operation	Target: 8 relevant institutions with projects or activities in operation	Target: 8 relevant institutions with projects or activities in operation	Target: 12 transboundary institutions in at least five basins have strengthened regional cooperation and integration	Target: 12 transboundary institutions in at least five basins have strengthened regional cooperation and integration	Target: 12 transboundary institutions in at least five basins have strengthened regional cooperation and integration	Target: 12 transboundary institutions in at least five basins have strengthened regional cooperation and integration	Target: 12 transboundary institutions in at least five basins have strengthened regional cooperation and integration
	ACHIEVEMENT								
	Achievement: \$7.9 billion potential investments influenced; \$5.0 billion mobilized investments influenced	Achievement: \$10.6 billion potential investments influenced; \$6.4 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced; \$6.2 billion mobilized investments influenced	Achievement: \$10.5 billion potential investments influenced; \$6.34 billion mobilized investments influenced	Achievement: \$11.7 billion potential investments influenced; \$6.34 billion mobilized investments influenced	Achievement: \$11.7 billion potential investments influenced; \$6.34 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced; \$6.34 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced; \$6.34 billion mobilized investments influenced	Achievement: \$11.2 billion potential investments influenced; \$6.34 billion mobilized investments influenced
ii) Number of strategic analyses and knowledge products used to illustrate the evidence base for cooperation, needs, and challenges Baseline: 0 strategic analyses conducted by CIWA	TARGET								
	Target: 18 strategic analyses conducted	Target: 20 strategic analyses conducted	Target: 20 strategic analyses conducted	Target: 20 strategic analyses conducted	Target: 20 strategic analyses used to illustrate the evidence base for cooperation	Target: 20 new strategic analyses used to illustrate the evidence base for cooperation	Target: 20 new strategic analyses used to illustrate the evidence base for cooperation	Target: 20 new strategic analyses used to illustrate the evidence base for cooperation	Target: 20 new strategic analyses used to illustrate the evidence base for cooperation
	ACHIEVEMENT								
	Achievement: 23 strategic analyses conducted	Achievement: 26 strategic analyses conducted	Achievement: 36 strategic analyses conducted	Achievement: 49 strategic analyses conducted and used	Achievement: 33 new strategic analyses conducted and used	Achievement: 28 new strategic analyses conducted and used	Achievement: 28 new strategic analyses conducted and used	Achievement: 18 new strategic analyses conducted and used	Achievement: 18 new strategic analyses conducted and used

INDICATOR	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Intermediate Result 2. Water resources management strengthened								
<p>i) Number of relevant transboundary institutions using improved analytical tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination</p> <p>Baseline: 0 institutions using tools, data and capacity improved with CIWA support</p>	TARGET							
	<p>Target: 7 relevant institutions with projects in operation that improve water and climate risk management and/or investment operation coordination</p>	<p>Target: 7 relevant institutions with projects in operation that improve water and climate risk management and/or investment operation coordination</p>	<p>Target: 7 relevant institutions with projects in operation that improve water and climate risk management and/or investment operation coordination</p>	<p>Target: 7 relevant institutions with projects in operation that improve water and climate risk management and/or investment operation coordination</p>	<p>Target: 11 institutions in at least 4 basins using improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination</p>	<p>Target: 11 institutions in at least 4 basins using improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination</p>	<p>Target: 11 institutions in at least 4 basins using improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination</p>	<p>Target: 11 institutions in at least 4 basins using improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management or investment operation coordination</p>
	ACHIEVEMENT							
	<p>Achievement: 8 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 9 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 11 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 10 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 11 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 13 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 13 relevant institutions have projects in operation that contribute to strengthening water resources management</p>	<p>Achievement: 13 relevant institutions have projects in operation that contribute to strengthening water resources management</p>
<p>ii) Number of stakeholders (including in communities and private sector) trained in improved biodiversity conservation or natural resource management activities.</p> <p>Baseline: 0 stakeholders trained in improved biodiversity conservation or natural resource management activities.</p>	TARGET							
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Target: N/A

INDICATOR	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Intermediate Result 3. Water resources development strengthened								
i) Number of investment opportunities with regional benefits that have been advanced through CIWA support Baseline: 0 investment opportunities with regional benefits advanced by CIWA	TARGET							
	Target: 31 investment opportunities with regional benefits influenced by projects in operation	Target: 35 investment opportunities with regional benefits influenced by projects in operation	Target: 35 investment opportunities with regional benefits influenced by projects in operation	Target: 35 investment opportunities with regional benefits influenced by projects in operation	Target: 42 investment opportunities with regional benefits that have been advanced through CIWA support	Target: 45 investment opportunities with regional benefits that have been advanced through CIWA support	Target: 46 investment opportunities with regional benefits that have been advanced through CIWA support	Target: 47 investment opportunities with regional benefits that have been advanced through CIWA support
	ACHIEVEMENT							
	Achievement: 32 investment projects are being advanced by projects in operation	Achievement: 31 investment projects are being advanced by projects in operation	Achievement: 37 investment projects are being advanced by projects in operation	Achievement: 40 investment projects are being advanced by projects in operation	Achievement: 42 investment projects are being advanced by projects in operation	Achievement: 44 investment projects are being advanced by projects in operation	Achievement: 44 investment projects are being advanced by projects in operation	
ii) Number of relevant transboundary institutions with an improved approach to sustainable investment planning and bankable investment preparation Baseline: 0 basins supported by CIWA	TARGET							
	Target: 5 investment opportunities with regional benefits influenced by projects in operation	Target: 5 investment opportunities with regional benefits influenced by projects in operation	Target: 5 investment opportunities with regional benefits influenced by projects in operation	Target: 5 investment opportunities with regional benefits influenced by projects in operation	Target: 6 relevant transboundary institutions with an improved approach to sustainable investment planning and bankable investment preparation	Target: 6 relevant transboundary institutions with an improved approach to sustainable investment planning and bankable investment preparation	Target: 6 relevant transboundary institutions with an improved approach to sustainable investment planning and bankable investment preparation	Target: 6 relevant transboundary institutions with an improved approach to sustainable investment planning and bankable investment preparation
	ACHIEVEMENT							
	Achievement: 5 institutions have relevant projects in operation	Achievement: 5 institutions and 4 national governments have relevant projects in operation	Achievement: 6 institutions and 4 national governments have relevant projects in operation	Achievement: 6 institutions and 4 national governments have relevant projects in operation	Achievement: 6 institutions with an improved approach to sustainable investment planning and bankable investment preparation	Achievement: 10 institutions with an improved approach to sustainable investment planning and bankable investment preparation	Achievement: 10 institutions with an improved approach to sustainable investment planning and bankable investment preparation	
iii) Design or preparation of new World Bank operations that were informed by CIWA activities	TARGET							
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
							Achievement: See IR Indicator 6 on page 62.	

INDICATOR	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Intermediate Result 4. Stakeholder engagement and coordination strengthened								
i) Number of basins with improved engagement with civil society, private sector and academia; percentage of engagements where improved stakeholder engagement explicitly supports the incorporation of gender issues into the design and/or implementation of water management and development activities Baseline: 0 engagements with improved stakeholder engagement and incorporation of gender considerations	TARGET							
	Target: 5 basins with projects or activities in operation; 50 percent of which include organizations representing interests of women and/or the poor	Target: 5 basins with projects or activities in operation; 50 percent of which include organizations representing interests of women and/or the poor	Target: 5 basins with projects or activities in operation; 50 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Target: 5 basins with projects or activities in operation; 50 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Target: 7 basins with improved engagement with civil society, private sector, and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Target: 7 basins with improved engagement with civil society, private sector, and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Target: 7 basins with improved engagement with civil society, private sector, and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Target: 7 basins with improved engagement with civil society, private sector, and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity
	ACHIEVEMENT							
	Achievement: 7 basin institutions have projects in operation that contribute to strengthening stakeholder engagement; 20% of which have an explicit linkage with organizations representing the interests of women	Achievement: 7 basin institutions have projects in operation that contribute to strengthening stakeholder engagement; 50% explicitly supports incorporation of gender issues into design and implementation of the activity	Achievement: 7 basin institutions have projects in operation that contribute to strengthening stakeholder engagement; 50% explicitly supports incorporation of gender issues into design and implementation of the activity	Achievement: 7 basin institutions have projects in operation that contribute to strengthening stakeholder engagement; 50% explicitly supports incorporation of gender issues into design and implementation of the activity	Achievement: 7 basins with improved engagement with civil society, private sector and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Achievement: 8 basins with improved engagement with civil society, private sector and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity	Achievement: Over 8 basins with improved engagement with civil society, private sector and academia; 60 percent explicitly supports incorporation of gender issues into design and implementation of the activity	
ii) Number of basins with increased water resources management and development information in the public domain Baseline: 0 basins	TARGET							
	Target: 4 basins with increased information in the public domain	Target: 4 basins with increased information in the public domain	Target: 5 basins with increased information in the public domain	Target: 5 basins with increased information in the public domain	Target: 5 basins with increased information in the public domain	Target: 5 basins with increased information in the public domain	Target: 5 basins with increased information in the public domain	Target: 5 basins with increased information in the public domain
	ACHIEVEMENT							
	Achievement: 4 basins have increased information in the public domain	Achievement: 4 basins have increased information in the public domain	Achievement: 5 basins have increased information in the public domain	Achievement: 5 basins have increased information in the public domain	Achievement: 5 basins have increased information in the public domain	Achievement: 6 basins have increased information in the public domain	Achievement: 6 basins have increased information in the public domain	
iii) Number of women in high or medium-skilled and/or management positions trained.	TARGET							
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	250

Annex 3—Risk Analysis

	RISK DESCRIPTION	MITIGATION APPLIED	NOTABLE STATUS UPDATES
1. GLOBAL RISKS	<p>Large-scale and far-reaching impacts of global risks such as pandemics, catastrophic climate events, wars and coups, and trade disputes. These risks can prevent CIWA staff and beneficiaries from carrying out their activities and might also result, under exceptional circumstances, in the delay or cancellation of funds for the program.</p>	<p>Mitigation measures for global risks are aligned with the broader World Bank and Water GP approach.</p> <p>Project teams routinely use technology to continue stakeholder engagement for all aspects of the projects, including providing technical support, activity and project design, community engagement, RBO governance meetings, and even large-scale fora such as NBDF. Moving forward, this ability to carry out hybrid and virtual meetings and missions will help mitigate risks arising from travel restrictions.</p>	<p>In FY23, the average impact of global-scale risks on CIWA projects has been modest relative to experiences with the COVID-19 pandemic. CIWA's direct work with Sudan has been paused since the 2021 coup until transitional peace and stability are established.</p> <p>CIWA is monitoring potential circumstances that warrant concern in this risk category such as the extended drought and growing food shortage in the Horn of Africa and coup to overthrow the democratically elected government of Niger in 2023.</p>
2. CHALLENGING POLITICAL CONTEXT	<p>All work on international waters has an inherent risk that domestic or international political issues (whether or not related to water issues) may negatively impact the context, resulting in long-term delay or even failure of specific projects. This risk is often inherently beyond the scope of CIWA or the influence of partners.</p>	<p>CIWA has a diversified portfolio geographically (projects in Horn, East, West and Central, and Southern Africa), in types of support (focus on strengthening information, institutions, and type of investments), and in type of clients (eg., RBOs, RECS, Ministries). Diversification helps mitigate political risks to the portfolio.</p> <p>Political economy analyses are mainstreamed in CIWA program planning. Projects are all informed by political economy considerations, which help to better anticipate risks, design projects that balance ambition and risk, and formulate mitigation strategies that enable implementation.</p> <p>While CIWA is not a dedicated World Bank program that supports early response and in situations affected by FCV, it works with many partners in fragile and conflict-affected situations to reduce some of the drivers of FCV—in particular, water insecurity. As stated throughout the report, improving transboundary water cooperation and water security improves livelihoods, health, and governance, which help mitigate FCV impacts.</p>	<p>Political challenges that CIWA encounters range from short-term bilateral tensions to regional displacement or FCV impacts. FCV has been a major barrier to project implementation including in Sudan, South Sudan, and in part of Ethiopia. Political changes in East Africa have paused direct engagements in Sudan but provided a window of opportunity to support capacity for transboundary water management in South Sudan. Continued insecurity in West Africa has limited the scope and ambition of some of CIWA's engagements; the highly volatile political context means that CIWA remains vigilant and ready to scale up its engagement should the situation improve.</p> <p>Overall, CIWA has an excellent track record of providing impactful support for transboundary WRM in FCV-affected situations, principally through high-quality technical and project management expertise provided by World Bank task team leaders; CIWA's Horn of Africa projects are such examples. These types of support can also contribute to preventing conflict and building peace and stability at regional level.</p> <p>FY23 did not involve major changes in political contexts that affect CIWA.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">3. INSUFFICIENT BASIN-WIDE COMMITMENT</p>	<p>Some countries within a basin may not have formal membership in the participating basin organizations, may challenge the basin organization's engagement with CIWA, or may simply be opposed to multilateral water resources development.</p>	<p>The CIWA basin engagement strategies and/or project development processes provide a means to engage with various stakeholders around the design of CIWA programs. Project and CIWA leadership engage in dialogue to disseminate the benefits of shared development and counter the narrative that water resources management is a zero-sum game. All CIWA's projects include significant effort for convening dialogues and riparian trust building (e.g., hydro-diplomacy).</p> <p>CIWA works to encourage strong cooperative working relationships. A Basin Support Plan is developed for all basins or regions in which CIWA has a long-term engagement. The Plan outlines CIWA's vision for support and development, including alignment of CIWA-supported projects with the broader objectives of each basin organization and potential synergies, overlaps or gaps, and ways to overcome them. CIWA also seeks out ways to facilitate learning across basins.</p>	<p>In some basins, not all countries are active in the RBO, and in all basins, some members are less active than others. The most common reasons for weak commitment include lack of visibility of the benefits of active participation, insufficient governance capacity or instability, and having a small stake in the impact of shared water resource management development.</p> <p>CIWA has ramped up its visibility through the now established communication portfolio and will continue to demonstrate the benefits of cooperation to its stakeholders. However, CIWA's own visibility, while relevant, may not be as important to inspire country commitment as visibility of the RBO or other regional institution. NBI especially makes many efforts through producing communications products, technical analyses, and data tools, and engaging national stakeholders through the Nile Basin Development Forum and the Nile Strategic Dialogue.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">4. INADEQUATE STAKEHOLDER VOICE AND INADEQUATE INCORPORATION OF GENDER CONSIDERATIONS</p>	<p>Stakeholders may not fully engage in the project cycle, resulting in inadequate voice in decision making, raising the potential of protest or push-back that could jeopardize or delay projects. Insufficient stakeholder engagement is also a risk to the quality of project outcomes.</p>	<p>The CIWA program prioritizes the inclusive involvement of stakeholders and thorough consideration of stakeholder needs and concerns throughout the project cycle. CIWA aims to strengthen stakeholder engagement in water resources management and specifically focuses on opportunities for gender equality.</p> <p>When starting a new engagement in a priority basin, CIWA works with clients to develop a balanced program with support that cuts across the four results areas. During preparation and implementation, CIWA mainstreams gender, poverty, and stakeholder engagement considerations as standard actions.</p> <p>CIWA has also provided gender equality expertise to its tasks teams to enhance project design and implementation. World Bank standard procedures strongly incentivize task teams to prioritize stakeholder engagement.</p>	<p>The diverse cultural and political landscapes in Africa provide different amounts of space for strong stakeholder voice and participation. In several transboundary basins, the stakeholder engagement strategy is the same or on a positive trajectory. But often RBOs may have a stakeholder engagement strategy that fails to be fully implemented.</p> <p>In FY23, CIWA supported project design to maximally elicit stakeholder engagement through new activities and continued to strengthen the current work stream best exemplified by NBD, and this model is now in the process of being adapted to West Africa to enhance stakeholder engagement, including civil society participation and voices of marginalized people. CIWA's recent Gender Equality and Social Inclusion Lessons Learned illustrates several examples, and CIWA's GESI Framework is elevating the program's efforts for transformative change, allowing women's voices to be heard and to participate in decision making.</p> <p>New projects in SADC, the Sahel, and Nile basins have included major efforts to improve the explicit incorporation of GESI into activities that originate with client demand.</p> <p>Additionally, the preparatory studies for all investments supported by CIWA follow World Bank procedures and include environment and social impact assessment and management plans, including stakeholder engagement activities and specific steps that take social issues, including gender, into account. Overall, there is no context change—women are still more often marginalized and disadvantaged than men virtually everywhere.</p>

<p>5. INADEQUATE IMPLEMENTATION CAPACITY AND READINESS CAN CAUSE SHORT- TO MEDIUM-TERM DELAYS</p>	<p>Some basin organizations may have insufficient capacity or experience to effectively engage in basin management and development, causing delays in project implementation that could affect the overall pace of the program achieving its objectives.</p>	<p>During project preparation, Bank experts assess implementation capacity and readiness of the recipient organization and plan the magnitude and complexity of CIWA's engagement accordingly. The Bank provides support for financial management, procurement, and project management. Project-supported capacity enhancement might also be a contingency for project approval. For example, a project may be conditioned on the hiring of an environmental and social expert to provide safeguards support. Many projects address this risk by designating an institutional support and capacity-building component. In addition, CIWA can employ Bank-executed programming as an initial financing modality to strengthen recipient implementation capacity and readiness.</p>	<p>Many of CIWA's projects are designed with the objective of creating or strengthening implementation capacity of client organizations. Despite mitigation measures, this has significant risks, and as detailed in CIWA's FY19 Annual Report, the risk manifested in multiple projects that closed in FY20 (Volta, Zambezi, and Niger basins). Much of CIWA's work in the Horn of Africa (Untapping Resilience) centers on enhancing implementation capacity to avoid delays.</p> <p>Readiness is often an issue that manifests on both sides—client and Bank project teams. Since FY20, CIWA has ramped up direct support to new project design with direct assistance from experts in cross-cutting themes including gender, FCV, biodiversity, and climate resilience. The added support from CIWA contributed to stronger starts.</p>
<p>6. UNEXPECTED CHANGES IN DONOR CONTRIBUTIONS AND PRIORITIES</p>	<p>Insufficient financing can cause risks raising expectations of potential recipient partners. Participating donors may be slow to commit resources relative to the demand for engagement by recipient basin organizations.</p>	<p>CIWA strives to continue fundraising, but demand from current and potential clients and partners will continue to exceed current funding expectations given the breadth and depth of need across Africa. CIWA conducts regular and careful management of the pipeline to match demand to available resources and set reasonable expectations with our partners.</p> <p>One challenge that CIWA faces is that many donors prioritize working at the most local level possible to address a problem, while CIWA, working at a regional level, is not always seen as the right match. However, for many communities, improving regional approaches to coordination, planning, investments, and management is the only sustainable long-term solution for addressing water security.</p>	<p>CIWA's strategic direction entails scaling up support to key issues including FCV hotspots, biodiversity protection, climate resilience, and transformative GESI, which remain key areas of focus of CIWA's donors.</p> <p>The economic impact of COVID-19, the war in Ukraine, and inflation may affect CIWA's fundraising efforts. The current level of funding does not nearly cover CIWA's pipeline, and increasing CIWA activities, particularly in FCV contexts, will need more resources to sustain high-quality program implementation and supervision. If CIWA is to maintain a portfolio dominated by RETFs, it will need donors to provide a critical level of resources to support these much larger grants.</p> <p>Additionally, because there is consistent high demand for CIWA's sustained support to transboundary RBOs, it is critical that this demand is balanced by delivery of member state financial commitment to their RBOs and by leveraging co-financing and partner contributions.</p>

<p>7. SUSTAINABILITY OF THE RESULTS</p>	<p>Making technical advances, identifying investments, and supporting regional organizations are generally low risk, and easily obtained in the short run but sustaining achievements, even amid favorable political conditions, is a major risk to all regional water resources work.</p>	<p>CIWA is demand-driven and responds to the requests of potential clients. Cognizant of the long timelines, high transaction costs, and nonlinearity of cooperative processes, CIWA carefully assesses the sustainability of potential support through in-depth consultations with the client organization and country governments and as informed by its own political economy analysis. Sustainability measures are included in program design. For example, capacity-building for resource mobilization accompanies project preparatory activities; processes for harmonization into national structures are outlined as part of formulating and endorsing regional institutions. Acknowledging that riparian commitments to cooperation can change over time and are driven by perceptions of risks versus opportunities for cooperation, CIWA places a strong emphasis on maintaining and strengthening the perception of opportunity (which demands its engagement) through knowledge and information sharing, analytical evidence, and continued dialogue. However, recognizing that riparian commitment to cooperative development can accelerate or lapse around specific issues, CIWA maintains the ability to provide both long-term systematic and short-term catalytic support, as well as the flexibility of delivering support across the 3Is, allowing it to fine-tune delivery.</p>	<p>While sustainability of the results remains a key area of risk to CIWA's project outcomes, the program is further enhancing its approach to ensure lasting results. A majority of CIWA's support is delivered through RETF activities, which strongly favors recipient ownership and sustainability. However, the lack of sustainability of regional institutions because of inconsistent and insufficient country contributions is perhaps the most significant threat to CIWA's work. New World Bank modalities to support regional engagements and organizations such as RBOs are currently being advanced through such projects as RCRP and offer an avenue that can help strengthen sustainability. In addition, CIWA management and project leadership is continually underscoring in dialogue and messaging the importance of country contributions and commitments to address this challenge.</p>
<p>8. FRAUD OR FUNDS NOT BEING USED APPROPRIATELY</p>	<p>CIWA projects follow World Bank procedures to ensure that funds are used appropriately and that anti-corruption guidelines are followed and maintain close project follow-up as per World Bank policy and practice. In circumstances where there are not enough guarantees that funds will be used appropriately, CIWA finances Bank-executed activities to ensure that World Bank systems are used for procurement and financial management.</p>	<p>CIWA projects follow World Bank procedures to ensure that funds are used appropriately and that anti-corruption guidelines are followed and maintain close project follow-up as per World Bank policy and practice. In circumstances where there are not enough guarantees that funds will be used appropriately, CIWA finances Bank-executed activities to ensure that World Bank systems are used for procurement and financial management.</p>	<p>While no issues were reported in FY23, this risk remains relevant, and CIWA continues to follow World Bank guidance and best practice in relation to appropriate use of resources and financial reporting.</p>

Annex 4—Financial Information

This section provides financial updates on the CIWA program. Unless otherwise noted, the financial information including exchange rates reflects the status as of June 30, 2023.

The CIWA program is supported by a Multi-Donor Trust Fund (MDTF) and administered by the World Bank on behalf of contributing development partners. CIWA's ongoing donors are Denmark, the European Commission, the Netherlands, Norway, Sweden, and the United Kingdom. This MDTF is known as a "Programmatic Multi-Donor Trust Fund," in which donors commit funds to support a thematic framework rather than a specific project. Within this framework, CIWA supports projects executed by recipient organizations and those directly executed by the World Bank.

Funding Process and Disbursement

Consistent with standard World Bank Trust Fund practices, donors pledge funding for CIWA (total pledge was US\$140.6 million) and funds are deposited on an agreed schedule (deposits totaled US\$131.1 million). Under CIWA's strategic planning efforts, funding has been allocated to specific programs and projects (current allocations are at US\$139.5 million) around the broad themes and areas endorsed by the CIWA Advisory Committee (AC).

Additional details on pledges, deposits, allocations, commitments, and disbursements are presented in this Annex.

After the funds are allocated to specific activities, CIWA works with clients to develop Grant Funding Requests to transfer funds into activity accounts. The World Bank follows technical, legal, and fiduciary procedures to approve projects and commits funds through its standard fiduciary processes (commitments totaled US\$131.5 million). Funds were disbursed according to the grant agreements and financing plans (disbursements reached US\$99 million). Figure A4.1 presents the overall status. Most of CIWA funds (98 percent) are allocated to existing projects and technical assistance. Any significant future activities will depend strictly upon the availability of new donor contributions.

Donor Pledges, Deposits, and Allocations

Donors deposit funds in the CIWA MDTF account according to an agreed schedule of deposits that are detailed in the Administration Agreement or other documents exchanged between the Bank and donors. This schedule may be revised if necessary to meet project disbursement requirements. Table A4.1 provides the status of donor pledges and deposits.

Figure A4.1. Overview of Donor Pledges, Deposits, Allocation, and Disbursement



Table A4.1. Donor Pledges and Deposits

CONTRIBUTING PARTNERS	CURRENCY	AMOUNT (IN DONOR CURRENCY)	AMOUNT (USD)	AMOUNT RECEIVED (USD)	OUTSTANDING BALANCE (USD)
The Netherlands	USD	55,552,581	55,552,581	46,052,581	9,500,000
Sweden (SIDA)	SEK	454,000,000	53,803,020	53,803,020	-
United Kingdom (FCDO)	GBP	14,500,000	21,592,060	21,592,060	-
European Commission	EUR	4,950,000	5,399,708	5,399,708	-
Denmark (DANIDIA)	DKK	18,700,000	3,398,597	3,398,597	-
Norway (NORAD)	USD	882,746	882,746	882,746	-
Total			140,628,712	131,128,712	9,500,000

As of June 30, 2023, US\$139.5 million has been indicatively allocated to CIWA projects and activities.⁸ Most CIWA funding has been assigned to activities under preparation or implementation. Unallocated funds amount to US\$2.4 million, and current demand for support far exceeds current resources. Given the centrality of shared waters to Africa's economic, social and environmental progress, we anticipate that this demand will continue to grow (see Table A4.2).

Of the US\$139.5 million indicative allocation, 93.9 percent (US\$131 million) is allocated to CIWA's sub-programs including the Horn of Africa, Nile Basin, West and Central Africa, Southern Africa, and Africa-wide analytical work.

CIWA includes recipient-executed projects and Bank-executed support programs that fund technical assistance and analytical work complementing the RETF projects. In some instances, CIWA has allocated funding for follow-up effort on current projects, based on project and organizational performance and riparian states' commitment.

By the end of FY23 the program had committed a cumulative US\$131.5 million in grants, of which projects and activities disbursed US\$99 million (75 percent). Table A4.3 provides a financial overview by sub-program and Table A4.5 provides details of all CIWA projects and their financial results for which grants have been established since the inception of the program.

Income, Disbursement, and Funding Balance

By the end of FY23, CIWA received US\$136.9 million, including US\$131.1 million in donor payments and US\$5.7 million in investment income from the CIWA account. Cumulative disbursements are at US\$102.4 million, including US\$99 million in projects and US\$3.4 million in administrative fees. The pace of disbursement accelerated in FY23. The balance of grant commitments is at US\$32.5 million. Table A4.4 presents the balance available in the CIWA account, which is approximately US\$34.5 million, or a balance of negative US\$6.1 million when the balance of current commitments of US\$40.5 million is considered.

Table A4.2. Overview of Availability and Allocation of Funding⁹

ALLOCATION OF FUNDING	USD
Pledges in signed Administration Agreements	140,628,712
Plus Current investment interest income	5,772,747
Less Administrative cost fee on TF071597	-1,460,856
Less Administrative cost recovery fee on RETF on TF072642	-1,950,000
Less Estimate Administrative cost recovery fee on RETF pipelines (Sudan)	-100,000
Funds Available for projects / activities	142,890,603
Less Allocation to projects/activities (agreed with AC)	139,524,565
Less Contingency/Reserve (agreed with AC)	1,000,000
Unallocated funds	2,466,038
% Allocated	98.3%

⁸ These allocations included actual grants and pipeline allocations endorsed by the CIWA Advisory Committee as of June 30, 2023, which may be subject to further changes after July 1, 2023.

⁹ 'Allocation' refers to the endorsement of allocation of funds by the CIWA AC—both moved to actual grants and notional allocations yet to move to grant activity accounts. 'Commitment' refers to recognition by internal World Bank systems that funds have been assigned to a project or activity. Funds are committed when a GFR has been approved by the World Bank trust fund management, putting in place a contractual or scheduled commitment that leads to actual expenditures in the future. 'Disbursement' refers to the transfer of funds from the grant account to the client's designated account after a request for specific investments is cleared by the Bank. For Bank-executed grants, disbursements are payments made against a purchase order or contract. 'Pipeline' activities in the sub-program are those for which a conditional allocation endorsement was made or subject to the approval of the World Bank project and trust fund systems. Pipeline development is on-going, subject to change including notional allocations after June 30, 2023.

Table A4.3. Allocated, Committed, Disbursed and Pipeline Amounts

BASIN / SUB-PROGRAM		ALLOCATION AGREED WITH AC	GRANT APPROVED AMOUNT	DISBURSEMENT	COMMITMENT BALANCE	PIPELINE
HORN OF AFRICA		13,947,420	11,947,420	7,458,650	4,488,770	2,000,000
NILE		62,825,256	61,825,256	46,184,147	15,641,109	1,000,000
WEST AND CENTRAL AFRICA	Niger	5,903,772	5,903,772	5,903,772		
	Volta	2,964,237	2,964,237	2,964,237		
	ECOWAS	1,065,867	1,065,867	1,065,867		
	Lake Chad/ Sahel	6,806,295	6,206,295	4,213,254	1,993,041	600,000
	Senegalo-Mauritanian Aquifer Basin	1,500,000				1,500,000
	West and Central Africa Total	18,240,170	16,140,170	14,147,130	1,993,040	2,100,000
SOUTHERN AFRICA	Okavango	995,568	995,568	995,568		
	Orange-Senqu	1,695,822	1,695,822	1,695,822		
	SADC	11,749,344	11,749,344	4,571,440	7,177,904	
	Zambezi	12,316,497	12,316,497	12,316,497		
	So. Africa Programmatic Approach	1,909,882	1,909,882	1,822,236	87,646	
	Southern Africa Total	28,667,113	28,667,113	21,401,563	7,265,550	
CATALYTIC AFRICA WIDE TA		6,012,230	4,512,230	3,735,005	777,225	1,500,000
ENHANCED SUPERVISION (PIPELINE)		1,394,652				1,394,652
PROGRAM MANAGEMENT		8,437,723	8,437,723	6,118,015	2,319,708	
GRAND TOTAL (USD)		139,524,565	131,529,911	99,044,510	32,485,403	7,994,652

Financial Summary of Program Management

CIWA management costs include expenses incurred by the Program Management Unit (PMU) and the World Bank's technical experts who provide strategic advice and support. In addition to staff and consultant costs, this category includes costs associated with CIWA donor coordination, outreach, and communications, monitoring and evaluation, mid-term review, reporting, partnership meetings, and dissemination activities including website, brochure, and publications.

Since the program began in 2011, CIWA has spent approximately 4.5 percent on program management, keeping PMU expenses within the suggested range. Overall, the program has been cost-efficient in its management, benefiting from the robust financial management and monitoring systems established at program inception.

Future Funding Requirements and Resource Mobilization

CIWA regularly examines its existing portfolio and plans pipelines to achieve results across Africa. Lessons learned from implementation are integrated into planning of future engagements, alongside application of risk management tools in the context of CIWA finance, detailed in Annex 3.

Demand for the CIWA program has exceeded the program's current resources. At present, CIWA has allocated 98 percent of its available funding. In response to the substantial demand from its clients and to expand its impact, the program has identified a pipeline of potential projects that will exceed current resources. CIWA is therefore working actively to explore opportunities for additional sources of funding.

Table A4.4: Fund Balance¹⁰

FUND INCOME VS DISBURSEMENT & COMMITMENT BALANCE		USD
Total Deposits		131,128,712
Plus current investment interest income		5,772,747
Total Income		136,901,459
Less disbursement (CIWA projects/ activities)		-99,044,510
Less administrative cost recovery fee		-3,410,856
Balance		34,446,093
Less commitment balance in approved grants		-32,485,403
Total Balance (when including commitment balance in approved grants)		1,960,690
Less 2023/2024 pipelines—Sudan (2m); NBD (1m); Citizens Engagement on West/Central Africa (0.6m); Senegalo-Mauritanian Aquifer Basin (1.5m); Climate resilience on Eastern and Southern Africa Program (1.5m) and Project Supervision (1.4m) etc.		-7,994,652
Expected Balance (when including 2023/2024 commitments/pipelines)*		-6,133,962

*Donors to advance their contributions so that CIWA minimizes exposures and risks due to the size of commitments when compare to deposits

Table A4.5: Financial Details of Projects Funded by CIWA (US\$)¹¹

BASIN / SUB-PROGRAM	EXECUTED BY	NAME	TF#	COMMITMENT BALANCE	PIPELINE
HORN OF AFRICA	IGAD	Groundwater Information and Investments in the Horn of Africa	TF0B0514	2,700,000	2,633,000
	WB	Groundwater Information and Investments in the Horn of Africa	TF0A8681	693,788	693,788
	WB	Somalia - Support to Transboundary Water Resources Management (including Juba and Shebelle River)	TF0A7944	1,155,687	1,154,769
	WB	Strengthening Resilience in the Horn of Africa	TF0B2448	1,397,945	1,397,945
	WB	Untapping Resilience: Groundwater Management and Learning in the Horn of Africa's Borderlands	TF0B8456	5,000,000	1,579,148
	WB	South Sudan Transboundary Waters	TF0C0362	1,000,000	
	TBD	Sudan Flood Management (New RETF project)	TBD	2,000,000	
	HORN OF AFRICA TOTAL				13,947,420

¹⁰ Donors to advance their contributions so that CIWA minimizes exposures and risks due to the size of commitments when compared to deposits.

¹¹ Pipelines endorsed by AC in purple; * subject to confirmation at the upcoming AC Meeting; and LCLS refers to 'grant legally closed'.

NILE	NBI (incl NEL, EN)	Nile Cooperation for Results (NCORE) + AF 1 and 2	TF013767	22,854,134	22,854,134	
	NBD	Engaging Civil Society for Social and Climate Resilience in the Nile Basin (NBD) + AF 1	TF015834	4,438,976	4,438,976	
	WB	Nile Basin Support Program	TF0A2051	1,657,727	1,657,727	
	WB	Enhanced Supervision (NBD)	TF014064	597,104	597,104	
	WB	Enhanced Supervision (NCORE)	TF015335 / TF0A0526	1,098,042	1,098,042	
	NBI (incl NEL, EN)	Nile Cooperation for Climate resilience	TF0B4716	30,000,000	14,803,191	
	WB	Enhanced Supervision (Nile Cooperation for Climate resilience)	TF0B5495	1,179,273	734,973	
	NBI (incl NEL, EN)	Nile Basin Discourse (additional financing through NCCR)	TBD	1,000,000		
	NILE TOTAL				62,825,256	46,184,147
WEST AND CENTRAL AFRICA	NIGER	NBA	Niger River Basin Management Project	TF018539	4,198,203	4,198,203
		WB	Niger Basin Support Program	TF018616	1,162,140	1,162,140
		WB	Enhanced Supervision (NBA)	TF016609	543,429	543,429
	Niger subtotal				5,903,772	5,903,772
	VOLTA	VBA	Volta River Basin Strategic Action Programme Implementation Project	TF016611	1,979,795	1,979,795
		WB	Volta Basin Support Program	TF015556	499,879	499,879
		WB	Enhanced Supervision (Volta)	TF015557	484,563	484,563
	Volta subtotal				2,964,237	2,964,237
	WEST AND CENTRAL AFRICA	WB	P2.2: WRM in West Africa (ECOWAS)	TF016610	1,065,867	1,065,867
		WB	P2.3: Lake Chad Policy Dialogue (1)	TF0A1005/ TF17506/ TF015878/	861,695	861,695
		WB	West/Central Sahel-Piloting Innovation Tools for WRM	TF0B2227	444,600	424,771
		WB	West/Central Sahel-Knowledge Support for Resilience Planning and Investments	TF0B2228	2,900,000	1,449,070
		WB	West/Central Sahel-Knowledge Support for Resilience Planning and Investments (Reserve for add'l funding)	TBD	600,000	
		WB	Lake Chad (II, BETF)	TF0B5943	1,000,000	481,319

		WB	Sahel Ground Water Initiative	TF0B3793	1,000,000	996,399
		WB	Senegalo-Mauritanian Aquifer Basin (New BETF)*	TBD	861,695	861,695
		West and Central Africa subtotal				62,825,256
	WEST AND CENTRAL AFRICA TOTAL				62,825,256	46,184,147
SOUTHERN AFRICA	OKAVANGO	WB	P2.1: Okavango Multi-Sector Investment Opportunities Analysis	TA0A0105	995,568	995,568
		Okavango subtotal				995,568
	ORANGE-SENQU	Botswana	Lesotho Highlands - Botswana Water Transfer	TF016233	1,527,322	1,527,322
		WB	Enhanced supervision (LH-B)	TF016038	168,500	168,500
		Orange-Senqu subtotal				1,695,822
	SADC	SADC	Sustainable Groundwater Management in SADC Member States	TF016748	2,000,000	2,000,000
		WB	Enhanced preparation (SADC)	TF015336	299,344	299,344
		SADC	Sustainable Groundwater Management II	TF0B5735	9,000,000	2,088,902
		WB	Enhanced preparation and supervision	TF0B5830	450,000	183,194
		SADC subtotal				11,749,344
	ZAMBEZI	ZAMCOM	Zambezi River Basin Management Project (ZAMCOM)	TF018921	4,000,000	4,000,000
		ZRA	Zambezi River Basin Development Project (ZRA)	TF016238	5,786,277	5,786,277
		WB	Zambezi River Basin Support Program	TF011577	1,001,192	1,001,192
		WB	Enhanced Supervision (ZAMCOM)	TF014926	648,749	648,749
		WB	Enhanced Supervision (ZRA)	TF014927	880,279	880,279
		Zambezi subtotal				12,316,497
	SOUTHERN AFRICA PROGRAMMATIC APPROACH	WB	Southern Africa Drought Resilience Umbrella Program	TF0B3679	450,000	403,666
		WB	Scoping and Preparation Work for Resilience in So. Afr.	TF0B2156	59,882	59,882
		WB	Southern Africa Drought Resilience Energy System	TF0B3730	400,000	390,104

		WB	Southern Africa Drought Resilience Cities	TF0B3706	400,000	388,036	
		WB	Southern Africa Drought Resilience - Livelihood and Food Security	TF0B3669	400,000	398,635	
		WB	Prioritizing Resilient Transboundary Infrastructure in Southern Africa	TF0B8090	200,000	181,913	
	SOUTHERN AFRICA TOTAL				28,667,113	21,401,563	
CATALYTIC	OPPORTUNISTIC	WB	P2.4: Lake Tanganyika Conference	TF0B6056	0	0	
		WB	P2.5: Luapula River Basin Development	TFOA5600	203,877	203,877	
	AFRICA-WIDE	WB	P1: Strategic Overview of International Waters in Africa	TF011569	280,358	280,358	
		WB	P1: Economic Rationale for Cooperation	TF011626	315,659	315,659	
		WB	P1: Political Economy Analysis	TF016821	517,035	517,035	
		WB	P3: Facilitating Africa Wide Hydromet Services	TFOA0106	97,136	97,136	
		WB	P3: Cooperation for Climate Resilience	TFOA1627	174,579	174,579	
		WB	P4: Capacity Building and Knowledge Exchange	TFOA0107	260,564	260,564	
		WB	P4: Improving Public Access to Basin Data	TF016747	295,077	295,077	
		WB	Enhancing Resilience of Water Resources Management	TF0B1074	55,465	55,465	
		WB	Great Lakes Water Quality	TF0B1226	296,502	296,502	
		WB	Digital Data Initiative	TF0B5148	1,000,000	356,253	
		WB	Biodiversity Conservation and Transboundary Water Cooperation	TF0B6640	15,978	15,978	
		WB	Climate resilience on Eastern and Southern Africa Program		1,500,000		
		WB	Pipelines (tbd)	TBD			
		WB	Peer Review / Management	TF019125	1,000,000	866,522	
		CATALYTIC TOTAL				6,012,230	3,735,005
		SUB-TOTAL (PROJECTS)				129,692,190	99,044,510
		ENHANCED SUPERVISION	WB	Implementation Fund on RETF Pipelines (tbd)	TBD	1,394,652	
		PMU	WB	Program Management and Administration	TF011372 / 11377 TF0B1847 / TF0B1846	8,437,723	6,118,015
TOTAL				139,524,565	99,044,510		

Notes: Pipelines endorsed by AC in purple* subject to confirmation at the upcoming AC meeting; and LCLS refers to grants legally closed.

Annex 5—Value for Money

The following measures can be used to assess CIWA's economy, efficiency, and effectiveness, which together characterize the program's value for money:

Economy

1. Program Management and Administration

Estimated at 6 percent of contributions to the fund (but only charged against actual costs), this fee covers all management and administration responsibilities of the program management team including developing and implementing program-specific management tools, procedures, and systems; negotiating the replenishment and expansion of existing programs; soliciting and evaluating activity proposals and allocating programmatic funds to implementing units; work program planning; program resource planning; budget planning and management; program monitoring and evaluation; program communications and outreach; donor visibility, coordination and meetings; and results reporting.

2. Enhanced Preparation and Supervision

To ensure high-quality program delivery, World Bank policies require ensuring that implementation of trust fund activities complies with applicable Bank policies and procedures and that all recipient-executed activities are adequately supervised and implemented in line with the terms and conditions of the Administration and Grant Agreements and Bank supervision standards and procedures. Preparation and supervision costs cover expenses for identifying and scoping possible projects, supporting preparation, undertaking implementation support, and supervision.

Table A5.1 shows CIWA's cumulative leverage ratio at the close of FY23, which illustrates CIWA's economy in relation to its allocations.

PROJECT	CIWA CONTRIBUTION (US\$, MILLIONS)	CO-FINANCIER	PARTNER CONTRIBUTION (US\$, MILLIONS)
Sustainable Groundwater Management in SADC Member States Phase 2	9.0	GEF	4.57
Nile Cooperation for Climate Resilience (NCCR)	30	GFDRR GFDRR Korean Green Growth TF	0.1 0.3 0.65
Nile Cooperation for Results	23.5	NBTF	16.5
Southern Africa Development Community Engagement	2.0	GEF	8.2
Volta River Basin Institutional Development and Strategic Action Program Implementation Project	3.5	GEF	7.2
CIWA Contribution	68	Leveraged Funds	37.5

As specified in the Administration Agreement, the Bank will seek the CIWA Advisory Committee's prior approval in case enhanced supervision costs of CIWA activities increase beyond the 6 percent amount noted in the agreement. CIWA has established norms to maintain enhanced supervision costs under 6 percent of contributions to the fund—one-time identification and preparation cost of US\$150,000 per project and implementation supervision cost of US\$100,000 per year for three years over the duration of a project. CIWA's enhanced supervision costs are lower than standard IDA operation costs. World Bank Africa Region data show that the average cost to prepare an investment project is approximately US\$350,000 and supervision of a project is approximately US\$150,000. Costs for preparation and supervision of regional projects under IDA are normally expected to be higher due to additional complexity, yet CIWA achieves lower costs by basing project budgets on a careful assessment of estimated costs and through effective procurement processes, cost-sharing, and greater travel efficiencies, using video connection for meetings when possible, convening CIWA meetings back-to-back when feasible, and linking to other water sector-related meetings to take advantage of synergies. Within the overall 6 percent cap, the program manager has discretion to allocate additional preparation or supervision funds to individual projects based on need.

3. Leverage Ratio

CIWA improves its economy by leveraging additional sources of funding, thereby reducing its unit cost of inputs in relation to the overall sum of outputs it mobilizes. CIWA uses the following metric as an indicator of increased economy due to leveraging of funds from additional sources:

$$\text{Leverage ratio} = \frac{\sum \text{Funds leveraged from additional sources for CIWA projects}}{\sum \text{CIWA contributions to cofinanced projects}}$$

In terms of leveraging additional funds to improve the economy of CIWA-supported projects (by expanding overall output and thus reducing the per unit cost of CIWA inputs), CIWA co-financed NCCOR in partnership with NBTf, and three projects—SADC Groundwater Management phase 1 and 2 and Volta River Basin Strategic Action Program Implementation—in partnership with GEF. NCCR received co-financing for its work on the Flood Early-Warning System in the Eastern Nile and added funds from GFDRR and the Korean Green Growth Fund (for water quality work).

Leverage ratio = 1.81, e.g., on average, for every US\$1 that CIWA contributed to co-financed projects, CIWA leveraged additional funding sources to provide input of US\$1.81 to its projects.

While it is not included in the economy analysis, it should be noted that CIWA's HOA Groundwater Initiative led to a US\$385 million IDA-funded World Bank project, Groundwater for Resilience, and that CIWA's new BETF, Untapping Resilience, is directly supporting the large project. Had CIWA contributed the money directly to Groundwater for Resilience, this methodology would include the US\$385 million as a co-finance contribution, in Table A5.1, yielding a total of US\$422 million in leveraged funds instead of US\$37.5 million. The same logic applies to the Regional Climate Resilience Program worth \$380 million, which CIWA will support with a BETF in FY24.

Effectiveness

CIWA measures its effectiveness, e.g., its ability to achieve its intended program development outcomes relative to its targets, through the program indicators. As in previous years, CIWA partially met its targets in FY23. CIWA exceeded one PDO target for the number of beneficiaries while falling short of the target for the value of investments. The number of investments (IR indicator) also did not meet the target and did not increase this year. CIWA expects new investments to be identified soon in several operations.

The indicators found in CIWA's Results Framework, however, do not fully capture secondary and tertiary benefits of CIWA support. A transboundary institution strengthened by CIWA, for example, can facilitate a series of subsequent regional cooperation actions. A vast number of people receive various levels of benefits as a result of each cooperative action facilitated by the strengthened transboundary institution. These outputs are often counted and reported on at the basin and project level but are too broad and distinct to aggregate at the program level, given the nature of issues supported and the timeframe it takes for such benefits to manifest. In the long run, therefore, CIWA's actual effectiveness is likely to be greater than that quantified through the indicators in the Results Framework.

Currently, total investment value influenced by CIWA (mobilized and potential) is US\$18.04 billion. This comprises US\$11.7 billion in potential investments influenced and US\$6.34 billion in mobilized investments influenced, while the FY23 targets for these values were US\$14 billion and US\$7 billion, respectively. Therefore, the achievement is roughly 85 percent of the target. However, the estimated number of direct beneficiaries of influenced investments is much greater than its aggregate target of 40 million people (e.g., ~93 million people).

Efficiency

CIWA estimates the efficiency of the program by calculating the ratio of the two PDO-level outcomes to the value of the overall programs:

$$\text{Investment influenced ratio} = \frac{\sum \text{Value of investments influenced}}{\sum \text{Value of overall program in operation}}$$

$$\text{Direct beneficiaries ratio} = \frac{\sum \text{Direct beneficiaries from investments influenced}}{\sum \text{Value of overall program in operation}}$$

These metrics are based on CIWA's PDO indicators and the size of the program in operation or the total allocated amount of the overall program envelope.¹²

The investment influenced ratio = 131, e.g., on average, for every US\$1 contributed by CIWA, the program influenced US\$131 of investments (mobilized and potential) that led to cooperative, sustainable, climate-resilient growth. The direct beneficiaries ratio = 0.69 beneficiaries/US\$ committed by CIWA, e.g., for roughly every US\$2 committed by CIWA, approximately one person will or has directly benefited from transboundary water resources potential or mobilized investments.

Commercial Improvement and Value for Money

CIWA maintains economy in its procurement (minimizing costs and ensuring high quality) by requiring that all recipient-executed activities finance goods, works, and services in accordance with the World Bank's guidelines on "Procurement under IBRD Loans and IDA Credits" and the Bank's guidelines on the "Selection and Employment of Consultants by World Bank Borrowers," jointly referred to as the "Procurement and Consultant Guidelines." Similarly, for all World Bank-executed CIWA activities, the Bank is responsible for, and carries out, procurement of goods and employment and supervision of consultants in accordance with applicable policies and procedures. Among other things, the guidelines provide specific instructions for use of Bank documents (e.g., standard bidding documents, requests for proposals, contract forms); conflict of interest; advance contracting; co-financing; mis-procurement; and fraud and corruption.

Availability of Finance

At the end of FY23, CIWA was a program of US\$139.5 million co-funded by Denmark, the European Commission, the Netherlands, Norway, Sweden, and the United Kingdom. Strong client demand for CIWA support, combined with 98 percent of the program's current funding envelope being provisionally allocated, means that CIWA needs to continue raising funds to expand its impact and ensure sustainability of successes.

Does the CIWA Program Still Represent Value for Money?

The CIWA program operates in a complex space where progress is non-linear. This means that progress and setbacks go hand-in-hand and may affect development indicators from time to time. However, the evidence strongly suggests that the CIWA program still represents value for money. Specifically, CIWA partially met its intended PDO targets, and numerous CIWA-influenced investments successfully mobilized financing; CIWA maintained its Program Management & Administration Costs and enhanced supervision costs under 6 percent and CIWA performed well in all three metrics (economy, effectiveness, and efficiency) in FY23. The CIWA program therefore demonstrated its commitment to the principles of economy, efficiency, and effectiveness and strongly represents value for money.

¹² Note that the accounting for these two indicators has changed from past years—the difference being that this year the denominator considers the value of the overall program in operation (amount allocated from the overall program envelope) instead of only the funding in operation in the CIWA-supported projects that influenced the particular investments and beneficiaries. Using program-level values in calculating these indicators provides an improved picture of program-level efficiency.

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.



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