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RESILIENCE IN THE LIMPOPO BASIN (RESILIM) PROGRAM

Final Report

October 1, 2017

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Cover photo: Across the Limpopo River Basin, the livelihoods of people such as this fisherman in Mozambique depend on effective transboundary management of natural resources, including water and biodiversity, as well as future climate impacts. Credit: Climate Investment Funds Action, 2014.

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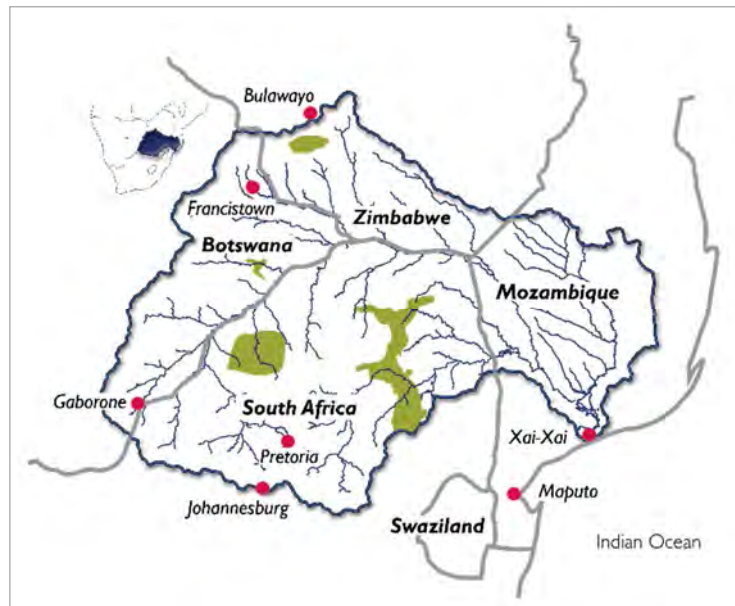
ACRONYMS

CBNRM	community-based natural resource management
CDS-ZC	Center for the Sustainable Development of Coastal Zones
GLTFCA	Great Limpopo Transfrontier Conservation Area
GWPSA	Global Water Partnership Southern Africa
IGRAC	International Groundwater Resources Assessment Centre
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
JPTC	Botswana-South Africa Joint Permanent Technical Committee on Water Quality and Water Hyacinth
KYT	Kgetsi ya Tsie
LIMCOM	Limpopo Watercourse Commission
MRCA	Marico River Conservation Association
<i>R+V Report</i>	<i>Risk, Vulnerability & Resilience in the Limpopo River Basin (RESILIM)</i>
RESILIM	Resilience in the Limpopo Basin Program
SADC	Southern African Development Community
SANBI	South African National Biodiversity Institute
SAWC	Southern African Wildlife College

EXECUTIVE SUMMARY

From June 2012 to December 2017, the USAID-funded Resilience in the Limpopo Basin Program (RESILIM) contributed to significant advances in water management, biodiversity, and climate change adaptation across an area of Southern Africa as large as Sweden that is home to 18 million people. Through strategic interventions that helped build evidence for decision-making, strengthened institutions, raised key influencer and public awareness, and demonstrated scalable projects, RESILIM catalyzed progress on governance, policy, science, and community resilience, achieving measurable gains that will continue long after the program closes.

FIGURE 1. THE LIMPOPO RIVER BASIN



The goal of RESILIM, a five-year contract funded and administered by USAID/Southern Africa, was to improve transboundary management of the Limpopo River Basin and enhance the resilience of its people and ecosystems. With the support of the four Basin governments — Botswana, Mozambique, South Africa, and Zimbabwe — the program was geared toward collaboration with the Limpopo Watercourse Commission (LIMCOM) on three strategic objectives:

1. Reducing climate vulnerability by promoting the adoption of science-based adaptation strategies for integrated transboundary water resource management
2. Conserving biodiversity and sustainably managing high-priority ecosystems
3. Building the capacity of stakeholders to sustainably manage water and key ecosystems

Consultation, collaboration, and partnership were at the heart of RESILIM's approach. Established as a consortium led by Chemonics International, the program involved three subcontractors: Global Water Partnership Southern Africa (GWPSA), an NGO; Cape Town-based international environmental consultancy OneWorld Sustainable Investments (OneWorld); and strategic communications specialist Overseas Strategic Consulting.¹ Grants to more than a dozen local and international partners extended the program's reach while seeding a diverse set of scalable and sustainable initiatives. These aimed at, for example, creating eco-friendly jobs, diversification from rain-dependent livelihoods, reclamation of polluted water, reduction of poaching, restoration of degraded coastal habitats, and youth education.

RESILIM's high-level results include:

- **Major advances on policy and governance that fully invested Basin governments in efforts to secure water, protect biodiversity, and adapt to climate change, along with plans and tools to strengthen day-to-day management of these objectives.** Along with formal contributions to the climate and biodiversity strategies of Botswana, South Africa, and

¹ The International Union for Conservation of Nature (IUCN) was initially part of the consortium, but it dropped out during startup.

Zimbabwe, RESILIM helped broker lasting institutional arrangements related to transboundary management of water quality, water sources, national parks and conservation areas, and disaster preparedness. In total, 38 significant policies and management plans were enacted across the Basin through RESILIM efforts. This work strengthened the corresponding institutions and the people who run them: More than 250 government leaders and technical managers received training and other capacity development on transboundary management of natural resources and climate change adaptation.

- **Foundational contributions to the scientific evidence base essential to effective management of water and biodiversity in the Basin, and provision of related decision-making tools.** The 25 in-depth scientific reports and analyses included detailed studies on environmental flows, water quality, and disaster preparedness; a landmark assessment of risk and vulnerability that prioritized eight Resilience Action Areas across the four Basin countries; an economic valuation of coastal mangrove habitat in Mozambique; a data-rich Limpopo River Basin Atlas documenting the natural and man-made drivers of ongoing change in the Basin; and a comprehensive hydrological mapping and database on an aquifer shared by Botswana and South Africa that will serve as a model for future transboundary collaboration on shared groundwater.
- **Significant investments in helping people and communities build resilience through new climate-friendly livelihoods and stronger systems for resolving conflicts and managing competition for resources.** Accomplishments included helping create jobs related to bush firefighting in South Africa, the production of sustainable food and cosmetic products from marula trees in Botswana, and restoration of coastal mangrove habitats in Mozambique. These activities inspired community-driven initiatives to conserve nearly 450,000 hectares (1.1 million acres) of threatened ecosystems, some of which feature irreplaceable high-altitude water-productive catchment areas. Training and public education helped raise awareness on water and biodiversity and prepare Basin citizens for climate change. More than 4,500 men, women, and youth received training on water conservation, protection of biodiversity, and climate change adaptation; awareness and outreach efforts reached another 8,000 people.

Lessons and insights that may help others seeking to build resilience include:

- Effective resilience-building requires democratic and accountable governance; awareness and knowledge management systems; a motivated private sector; organizational and institutional capacity and visionary leadership; and socioeconomic incentives.
- Resilience-building and the mainstreaming of resilience thinking are long-term processes that require sustained commitment and ongoing monitoring.
- Over the lifespans of development programs, government institutions are the one constant. As such, political leadership is a prerequisite for sustainability.
- While working across boundaries with sovereign nations, strong relationships are indispensable to navigating political complexity, catalyzing joint management, and minimizing conflict or competition over resources.
- Collaboration with existing institutions within their frameworks, rather than creating new initiatives, helps add value and inject new energy. It also avoids a situation that could undermine institutions mandated to manage or conduct activities and consume already scarce resources.
- Simultaneous documentation of indigenous knowledge and modern science on natural resources, together with stakeholder engagement to harmonize the information, maximizes the value of both information sources.



A young girl living in the Great Limpopo Transfrontier Conservation Area enjoys the last light of day. Across the Limpopo River Basin, people's ability to find sustainable livelihoods largely depends on the success of government and non-governmental actors working across boundaries to ease water scarcity, conserve biodiversity, and adapt to climate change.

CREDIT: GIDEON MENDEL.

1. PROJECT CONTEXT

RESILIM implementation coincided with Southern Africa's worst drought in 40 years, a major economic and humanitarian shock that reinforced the dire need for effective leadership on water management, climate adaptation, and biodiversity conservation.

CLIMATE AND WEATHER

Following two years of poor agricultural production and a macroeconomic downturn caused by weak international commodity prices and national currency declines, the drought affected 4.3 million people across the Basin, at least 1.2 million of whom needed emergency food assistance, especially in Zimbabwe and Mozambique. In areas of Botswana, Zimbabwe, and Mozambique, crop losses reached 100 percent. The maize harvest in South Africa, normally a surplus producer, was so far below average that it could not meet the country's domestic demand, let alone the huge needs across the region. The Gaborone Dam, which supplies Botswana's capital and surrounding areas, dried completely. (See Figure 2, below.) Outside of the Basin, on the border of Zambia and Zimbabwe, lack of water at the Kariba Dam crippled power generation across Zimbabwe. Above-average rainfall in late 2016 and early 2017 helped restore water supplies, but agricultural production was slow to recover and staple food prices, which disproportionately affect poorer households, remained well above average into 2017.



Such extreme events are likely to occur more frequently in the Basin as a result of the changing climate. Future climate projections center on higher temperatures, variable rainfall with cycles of droughts and floods, and more extreme storms. (See Figure 3, next page.)

In the last two decades, Mozambique has had twice as many cyclones as in the previous two decades — and nearly twice as many classified as Category 4 or 5. Annual flooding has claimed lives and caused significant damage to crops and other assets. Botswana experienced anomalous river flooding in 2013 and 2014. Flash floods have occurred more frequently in urban areas, including 2014 floods near Pretoria that killed a dozen people and caused \$12 million in damages.

FIGURE 2. THE SHRINKING GABORONE DAM

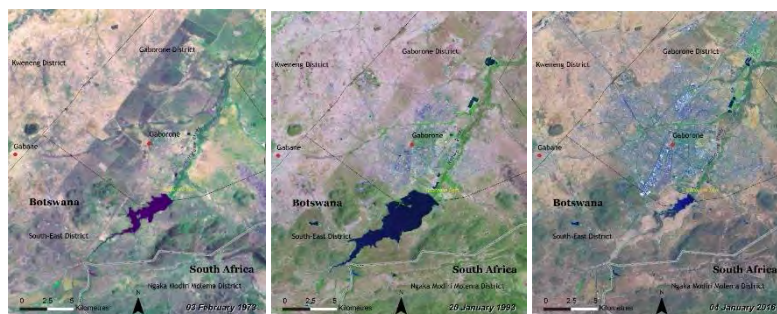
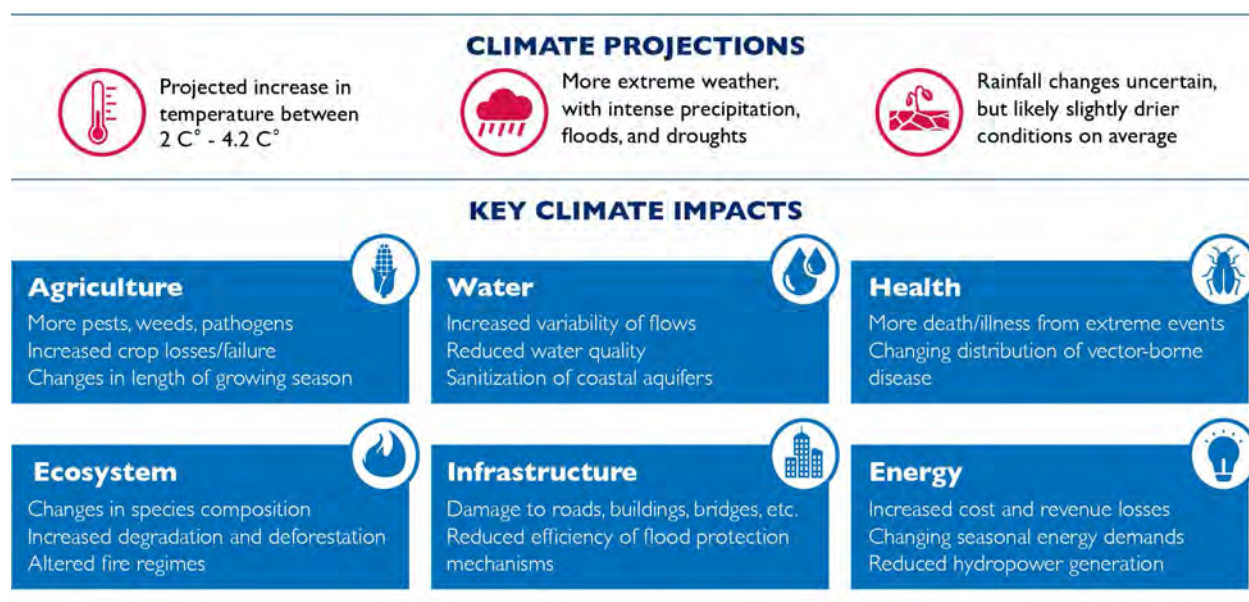


FIGURE 3. LIMPOPO RIVER BASIN CLIMATE PROJECTIONS AND IMPACTS



WATER DEMAND

Even after normal rains, water scarcity is a pressing concern across the Basin, one not likely to go away. Water demand is expected to increase by 46 percent by 2025 as a result of rapid urban population growth, expansion of mining and energy projects, and large-scale national development projects. Currently, agriculture accounts for nearly 60 percent of water usage, the vast majority of it for commercial irrigation. Table 1 shows water use in the Basin by sector.

In terms of water management, the Basin is considered “closed,” meaning its current usage exceeds the amount of surface water it generates.

To fill the deficit, every year about 500 million cubic meters of water is transferred from the Orange-Senqu River Basin through the Crocodile and Upper Olifants Rivers, while water is again transferred out of the basin from the Mzingwane sub-basin of 60 million cubic meters into Bulawayo and surrounding areas in Zimbabwe. Within the basin, water is also transferred from the Vaal Eastern Sub-system to address supply problems for Duvha and Matla power stations located in the Upper Olifants sub-basin as part of the Komati Water Scheme Augmentation Project (KWSAP). South Africa, home to 15 million of the Basin’s 18 million people, generates 46 percent of the available water in the Basin but accounts for 60 percent of total usage. This scarcity is yet another reminder of the vital importance of transboundary collaboration on resource allocation and management and resilience-building.

TABLE 1. LIMPOPO RIVER BASIN WATER USE BY SECTOR

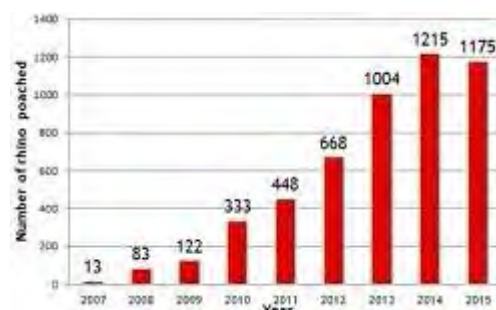
SECTOR	% OF TOTAL USE
Irrigation	58
Residential	21
Other industry	7
Mining	6
Power	5
Forestry	2
Livestock	2

BIODIVERSITY

Although much of the Basin is arid and prone to extreme weather, it has diverse landscapes, wildlife, natural resources, and people. Along with enormous mineral wealth and agricultural richness, the Basin is home to some of the world's premier national parks and wildlife areas. However, large areas are degraded and many water bodies are polluted. People in densely populated areas tend to rely on relatively unproductive subsistence agriculture. These challenges threaten the Basin's ecology and the resilience of the millions of people whose livelihoods depend on it. Population growth and development are likely to intensify these problems.

Poaching is a notable threat to biodiversity. South Africa's Department of Environmental Affairs and Save the Rhino reported that the number of rhinos poached rose from 13 in 2007 to 1,175 in 2015 (Figure 4). Although slightly fewer rhinos were poached in South Africa in 2015 than 2014, the number in Zimbabwe doubled during the same time. For Africa as a whole, the total number of rhinos poached during 2015 was the highest in two decades.

FIGURE 4. RHINO POACHING IN SOUTH AFRICA 2007-2015



GOVERNANCE

The Basin is a shared water course with transboundary natural resources such as water, wildlife, and fish; effective management of these resources depends on the harmonization of plans, strategies, and interventions. Strong governance systems and institutional arrangements are required to ensure this harmonization.

The Basin falls under the Southern African Development Community's (SADC) regional cooperation for development mandate, which includes 15 countries. Along with a handful of other organizations in the Basin, SADC loosely oversees LIMCOM, an advisory body created in 2003 but officially launched in 2014 to support transboundary decision-making across the Basin, with a focus on integrated water management.

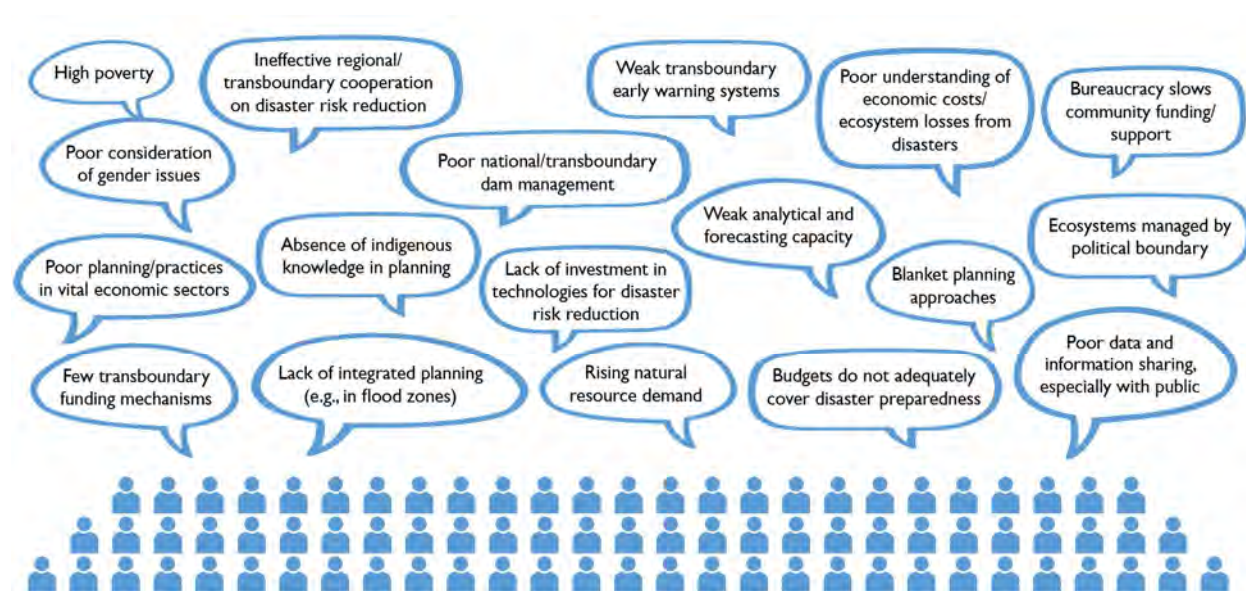


Government ministers from the Limpopo River Basin's four countries (Botswana, Mozambique, South Africa, and Zimbabwe) participate in the launch of LIMCOM in July 2014.

Based in Maputo, the capital of Mozambique, LIMCOM has faced significant organizational challenges and political impediments. Member governments have not consistently supported or participated in its proceedings, and the secretariat lacks staff. (Its first permanent executive secretary was only appointed in early 2017.) As a result, it has not been in a position to lead or even facilitate the development of a shared vision for the Basin. To a certain extent, the situation is beyond LIMCOM's control, as it is an advisory body with little ability to hold member governments accountable. As noted in RESILIM's 2015 report *Risk, Vulnerability, and Resilience in the Limpopo River Basin* (the *R+V Report*), "Regional cooperation is characterized by the protection of vested national interests ... current transboundary governance arrangements are not strong enough to promote the extent of resilience-building needed in the Basin."

It is within this dynamic and challenging environment that RESILIM undertook its work. Figure 5 shows what stakeholders said about challenges in the Basin.

FIGURE 5. STAKEHOLDER COMMENTS ABOUT CHALLENGES IN THE BASIN



These are a selection of key challenges identified by stakeholders during the consultation phase of this Action Plan. The framework used to structure stakeholder consultations touched on nine factors for resilience adapted from *Toward Resilience – A Guide to Disaster Risk Reduction and Climate Change Adaptation for Practical Action* (M. Turnbull et.al. 2013).

2. RESILIM HIGHLIGHTS AND ACHIEVEMENTS

STRATEGIC APPROACH

Responding to the challenging development and political context of the Limpopo River Basin, as well as its sheer size and diversity, RESILIM made strategic choices to ground its work in strong science, leverage partnership opportunities, capitalize on collaborations at different levels of government, and focus on sustainability. Elements of this strategy included:

THE NEXUS APPROACH. Articulated in the *R+V Report*, this concept suggests that success in reducing vulnerability and building the resilience of people and ecosystems lies in integrating scientific evidence on water, biodiversity, and climate into policies and actions to improve governance, strengthen livelihoods, and manage population growth. Rather than a siloed approach characteristic of some bureaucracies, the Nexus Approach encourages stakeholders to think systematically across the three sectors in translating evidence into action. Its premise is that a systems approach will assure farther-reaching, longer-lasting progress in building resilience. Promoted through distribution of the *R+V Report*, in presentations at more than a dozen high-level forums, and through collateral materials that used plain language, the Nexus Approach gained traction among key influencers, driving change and inspiring new approaches to policy and institutional arrangements.

FIGURE 6. THE NEXUS APPROACH



As a result of RESILIM's advocacy of Nexus, LIMCOM expanded its focus on water to include biodiversity and climate in its 2016-2020 *Integrated Water Resources Management Plan*, known as Vision 2020. Furthermore, the Southern African Wildlife College (SAWC), the region's leading training institute for conservation practitioners from SADC, made it a major theme of its revised curriculum. The college also made it a thematic focus of its new second campus, a landmark shift away from wildlife and parks management exclusively to a broader mandate centered on the engagement of local communities in fostering economic development, preventing poaching, and reducing human-animal conflict.

LEVERAGING PARTNERSHIPS. The RESILIM team skillfully developed strong working relationships with a wide range of government and non-government actors in all four Basin countries to build a community of practice around Nexus-based resilience-building. The team achieved this by convening multi-stakeholder technical workshops across the Basin to promote new research and information such as the *R+V Report* and the *Limpopo River Basin Disaster Preparedness Action Plan* (also referred to as the disaster risk reduction strategy), and by adding value and new energy to existing partnerships, such as the Marico River Conservation Association's (MRCA) ongoing conservation activities in South Africa and work by the Center for the Sustainable Development of Coastal Zones (CDS-ZC) on mangrove restoration in Mozambique. The team also cooperated with USAID's Southern Africa Regional Environmental Program, which focused on resilience-building in the Okavango River Basin. For example, the two programs worked jointly to support US Government (Botswana Embassy) to facilitate setting up of the Wildlife Enforcement Network of Southern Africa and conduct SADC-wide training on climate change adaptation.

WORKING AT VARIOUS LEVELS. As it became apparent that activities to support the LIMCOM secretariat would proceed more slowly than the program design envisioned, RESILIM leadership capitalized on other opportunities. While maintaining strong buy-in from SADC leaders and representatives of LIMCOM member countries, RESILIM moved forward with targeted transboundary, bilateral, and local-level activities. The thinking was that these “ground-up” efforts (as opposed to “top-down”) would establish a positive record of engagement, yield Basin-specific experience on climate change adaptation, and, ultimately, catalyze transboundary momentum.

One example of this approach in action was RESILIM’s support of the Botswana-South Africa Joint Permanent Technical Commission on Water Quality and Water Hyacinth (JPTC). RESILIM support as a convener and provider of technical assistance expanded into self-sustaining, regular collaboration of the two governments on water quality monitoring and public reporting, data-sharing, and a first-ever agreement on managing transboundary groundwater in the Ramotswa Aquifer. This experience is likely to be replicated in two other Basin areas where countries share transboundary aquifers.

FOUR PILLARS OF SUSTAINABILITY. Early on, RESILIM leadership invested heavily in the sustainability of its work. At the midpoint of implementation, leadership, drawing on learning from the first two years on how best to strengthen resilience, oriented all activities around four pillars: knowledge management and communications, scalable adaptation projects, institutional capacity building, and leveraging partnerships and mobilizing resources. This subtle shift was intended to consolidate gains and ensure that other partners could and would continue activities.

“Among the most important developments in the Basin in recent years is the integration of climate change adaptation and biodiversity conservation into Basin water and resource management plans, with a specific focus on building capacity of government and civil society institutions in the protection and rehabilitation of high-altitude water catchments, as well as supporting development and implementation of adaptation strategies, protected areas, and management plans.”

— Sergio Siteo, Executive Secretary, LIMCOM

KEY RESULTS

STRENGTHENING DECISION-MAKING

One of RESILIM’s most significant achievements was a quantitative improvement in decision-making on issues related to water, biodiversity, and climate. This was rooted in expansion of the Basin-specific scientific evidence base, stronger policy frameworks, and increased technical capacity. Results across these elements are described below.

Building the evidence base

RESILIM supported research to strengthen decision-making on policies related to the Nexus Approach. For example, RESILIM provided technical input in the detailed review of environmental flows that formed part of a comprehensive Limpopo Monograph Study and thematic technical papers on effluent treatment, dams, and water distribution. These documents were developed as part of internal processes of RESILIM partners, such as LIMCOM, and are not publicly available. However, other centerpieces of this work include the [R+V Report](#), an innovative [groundwater mapping model](#), and an in-depth and data-rich Limpopo River Basin Atlas which will be made available online in the near future.

THE R+V REPORT. Drafted by RESILIM consortium partner OneWorld, this [report](#) was a desktop analysis of human and ecosystem risk and vulnerability to climate-related risks. The findings were ground-truthed over a series of validation workshops across the Basin, which included the participation

of government, NGOs, community representatives, and academic stakeholders. The analysis identified eight case study areas, dubbed Resilience Action Areas, where factors combined to make each unique in terms of vulnerability to climate change. These factors included existing risks such as poverty, environmental degradation, and weak infrastructure, as well as current ecosystem value, such as high biodiversity and water production. The case studies helped LIMCOM and other stakeholders set priorities in considering responses to climate change, ecosystem degradation, and vulnerable livelihoods. (Snapshot 1 on the next page discusses the impact of the *R+V Report*.)

THE LIMPOPO RIVER BASIN ATLAS. RESILIM and partners GWPSA and GRID-Arendal developed the atlas, titled *The Limpopo River Basin: Changes Challenges and Opportunities*. It integrates research and assessments into a comprehensive document about the ongoing effects of climate change on the Basin's people and ecosystems. Intended as a resource for policy action, the atlas depicts natural and anthropogenic change, its drivers, and possible interventions.

RAMOTSWA AQUIFER STUDIES. To help address water scarcity in the Basin, RESILIM partnered with the International Water Management Institute (IWMI) to investigate the future viability of the transboundary Ramotswa Aquifer as a resource for Botswana and South Africa. The work included a [socioeconomic and institutional assessment](#), detailed [hydrogeological mapping](#), a [management information system with an online database and tools](#), a [strategic action plan](#) to guide joint utilization and management, and [training](#) in harmonized monitoring and management of the aquifer. This work is acknowledged by LIMCOM who has directed that lessons learned from this activity will be applied to other aquifers in the basin, and that the second phase of work on the Ramotswa aquifer, funded by the USAID Global Development Lab, be included in LIMCOM's implementation framework. The work on the Ramotswa Aquifer, which extensively engaged the two national governments in development of joint policies, is discussed in Snapshot 3 on page 20.

"The nature of [RESILIM's] work is highly complex, with ecological, political, and social dimensions that must be carefully navigated. The team is able to operate in this space very effectively to produce meaningful results."

— USAID Contractor Assessment Report, 2016-17

Supporting policy and implementation frameworks

A shared vision of goals is a critical component of transboundary decision-making. To help realize LIMCOM's objective of developing a shared vision for the Basin, RESILIM supported efforts to align policies and frameworks within and across the four member countries. The program was directly involved in developing several key government policies and frameworks.

NATIONAL CLIMATE AND BIODIVERSITY STRATEGIES. RESILIM supported the governments of Botswana and [Zimbabwe](#), through technical assistance and consultative workshops, in drafting and adopting their national climate change strategies. In addition, the program participated in consultations and contributed language to South Africa's [2015-2025 National Biodiversity Strategy and Action Plan](#), which included resilience-building measures and a specific reference to the protection of high-altitude catchment areas.

COLLABORATION IN PRACTICE. Staffed by Botswana's and South Africa's departments of water affairs and initially crafted as a joint effort to combat invasive water hyacinth in the Upper Limpopo River, the JPTC has evolved with RESILIM support into a busy forum that takes collective action on shared water issues. RESILIM supported a series of strategic planning meetings to develop a memorandum of understanding, technical approaches to water hyacinth eradication efforts and water quality monitoring, and a community engagement strategy. This cooperation sparked a strong working

partnership for regular water quality monitoring with public reporting (involving stakeholders from different sectors) and active data-sharing, and cooperation on an agreement for reclaiming and sharing the transboundary Ramotswa Aquifer.

PREPARING FOR DISASTERS. With GWPSA, RESILIM developed [the Limpopo River Basin Disaster Preparedness Action Plan](#), which collated climate analyses and institutional assessments to lay out a plan to help Basin stakeholders shift from reactive to proactive approaches to reducing risk and vulnerability before disaster occurs. This disaster risk reduction strategy, developed in 2016 as a tool for LIMCOM, was promoted at workshops and forums.

FROM EVIDENCE TO POLICY

RESILIM's research on water and biodiversity-rich high-altitude catchment areas spurred new policy and empowered one community to protect local wetlands.

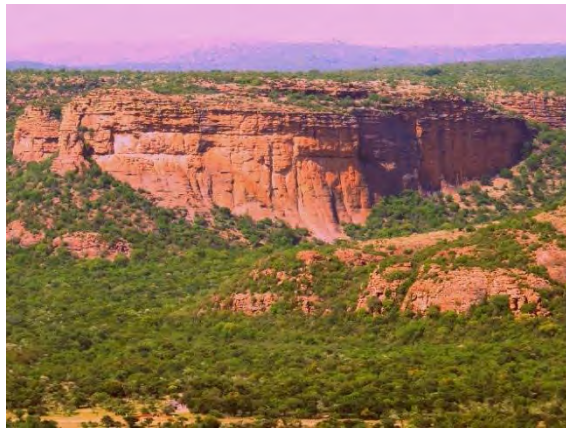


PHOTO: Lucas Namanyane

The Waterberg Escarpment in South Africa, one of six high-altitude catchment areas in the Limpopo Basin.

“The areas which have the highest biodiversity and levels of endemism are also those high-altitude areas with the highest rainfall and water runoff per unit area.”

— RESILIM's R+V Report

RESILIM's *R+V Report* raised key influencer awareness and contributed measurably to evidence-based decision-making in the Basin.

Among its most influential recommendations is the need to formally protect high-altitude catchment areas. Rich in biodiversity, these areas receive comparatively high rainfall and runoff, typically producing 100 times more water than low-lying areas. They have vast potential to open water flows and enhance the resilience of people and ecosystems to climate change.

Examples of how this recommendation influenced policy and decision-making include:

- Following consultations with RESILIM, South African leaders revised the *National Biodiversity Strategy and Action Plan*, a 10-year blueprint for conservation, including new language on the importance of high-altitude catchments and resilience-building.
- Similar recommendations were captured in LIMCOM's 2016-2020 *Integrated Water Resources Management Plan* (Vision 2020).
- In Nylsvley, South Africa, near protected wetlands, local activists cited the report in an effort to block an open-cast chrome mine. The provincial agency reviewing the application declined to authorize the project.
- The SADC delegation's statement at the 2015 World Parks Congress included *R+V Report* recommendations on the need for increased resilience of protected areas.

RESILIM succeeded in catalyzing action to protect these invaluable natural resources long into the future.

STRENGTHENING INSTITUTIONS. In 2015, RESILIM produced another management tool for LIMCOM, the [*Institutional Resilience Capacity Needs Assessment Report for the Limpopo River Basin*](#). The 70-page document, which included detailed studies of how governance institutions in Botswana, Mozambique, South Africa, and Zimbabwe manage resilience issues, directly informed program activities within the Basin-wide resilience strategy (Vision 2020)/IWRM Strategy 2017-2021 that LIMCOM developed with support from USAID RESILIM and GWPSA.

In 2017, RESILIM provided further support to LIMCOM by facilitating planning sessions between the newly appointed LIMCOM Secretariat and USAID to develop a draft first year workplan; review the draft 2016 – 2021 IWRM Plan (Vision 2020), and isolate activities that could be implemented in the first year to address institutional capacity challenges of the Secretariat.

PROMOTING COORDINATED INVESTMENTS IN RESILIENCE. To provide governments, the private sector, and other Basin stakeholders with a roadmap for working together to build resilience, RESILIM partner OneWorld produced [*Securing the Future of the Limpopo River Basin System: An Investment Strategy and Action Plan*](#). An [*executive summary of the strategy*](#) is also available. This recommended structuring investments around four pillars: governance, management, and compliance; institutional and capacity development; data and knowledge management; and assets, including ecological and man-made infrastructure. The document helped inform RESILIM's four pillars of sustainability (knowledge management and communications, scalable adaptation projects, institutional capacity building, and leveraging partnerships and mobilizing resources).

GUIDELINES FOR MINING IN PROTECTED AREAS. Through its ongoing partnership with the South African Man and Biosphere National Committee, RESILIM collaborated with South Africa's Department of Environmental Affairs to draft guidelines for mining activities in biosphere reserves. The guidelines are intended to assist decision-makers and biosphere reserve management in land use zoning, particularly how mining companies should address environmental impact assessments. Key partners, including Man and Biosphere Committees, the Department of Environmental Affairs, the South African National Biodiversity Institute (SANBI), the South Africa Local Government Association, and the Department of Mineral Affairs, endorsed the guidelines in 2017. The guidelines are also expected to feed into the Global Guide for Mining in Biospheres, a process that the Department of Environmental Affairs will lead on behalf of the AfriMAB network, which was created in 1996 in Dakar, Senegal, by the Regional Conference for Forging Cooperation on Africa's Biosphere Reserves for Biodiversity Conservation and Sustainable Development.

Data and tools

The need for data management tools, not envisioned in the RESILIM design, emerged during implementation. The program adapted and found resources to support data management, enabling partners to use the latest technology for managing and monitoring their work. Examples include:

KNOWLEDGE MANAGEMENT AND TRANSPARENCY ACROSS BIOSPHERES. In November 2016, RESILIM partnered with South Africa's Department of Environmental Affairs, the Kruger to Canyons Biosphere Region, Peace Parks Foundation, and SAWC to develop and pilot an information system and corresponding application for the region's biosphere reserves. Nicknamed BLISS, the Biosphere Land Use Information Support System provides the public access to the latest information and data about local biospheres, such as new mining applications and land management. It will also be a tool to facilitate coordination and information sharing among the five Man and Biosphere committees in South Africa. The *K2C Biosphere Info App* can be downloaded from the "Play Store" on android-based smart phones or the "App Store" on iPhone.

MANAGING TRANSBOUNDARY WATER. In December 2015, RESILIM grantee International Groundwater Resources Assessment Centre (IGRAC) built the [Ramotswa Information Management System](#), a tool for the shared and harmonized management and monitoring of the groundwater resources of the transboundary Ramotswa Aquifer. This was achieved through the partnership of IGRAC, RESILIM, IWMI, and the water affairs departments in Botswana and South Africa.

Building technical capacity

Training and capacity building were a part of nearly every RESILIM activity. Over its five-year lifespan, RESILIM helped 4,435 people, approximately 52 percent of whom were female, increase their climate change adaptation skills through almost 50 training sessions and other workshops. Participants included significant numbers of government technical staff at national, provincial, and local levels. Training topics included disaster management, vulnerability assessments, water quality monitoring, integrated water resources management, database and Geographic Information System skills, climate change science and adaptation strategies, community-based natural resource management (CBNRM), and other issues related to the Nexus Approach. These interventions helped reduce the significant gap in data and technical skills that often impedes effective management of natural resources.

Contributions in technical fora

As part of its effort to maintain close relationships with key stakeholders and influence decision-making on issues related to the Nexus Approach, RESILIM participated in and supported the participation of Basin partners in a wide range of conferences, including:

- Supported the participation of various partners in the USAID Resiliency Learning Workshop, 2017
- Presented a poster on the findings of the R+V report at the Resilience for Development Colloquium, 2017
- Participated in the annual SADC River Basin Organizations Workshops, annually
- Participated in the 4th Annual Green Youth Indaba, 2017
- Presented at Southern Africa Society for Disaster Reduction Conference, 2017
- Presented at Conference of Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, 2016
- Attended U.N. Sustainable Development Goals conference, November 2016
- Supported participation of IUCN in the World Conservation Congress, 2016
- Presented on water hyacinth at African Minister's Council on Water Congress, 2016
- Contributed to Southern Africa delegation's statement at the 6th World Parks Congress (specifically on the importance of building the livelihoods resilience in protected areas), 2016
- Participated in a Stakeholder Consultation Workshop convened by the Stockholm International Water Institute and Botswana Department of Water Affairs to provide input on their 2014-2016 program on waste water, sanitation resources management, raw water abstraction, and catchment management
- Facilitated, with the U.N. Environmental Program's World Conservation Monitoring Centre and SANBI, *Africa Rising: Mobilizing Biodiversity Data for Sustainable Development*, a four-day conference attended by 100 senior policymakers and conservation experts, 2015
- Facilitated, with the U.N. Environmental Program's Regional Office for Africa, a workshop centered on data needs related to natural capital assessments and ecosystem resilience, designed to improve access to the national data, statistics, and indicators for managing natural capital and building more resilience, 2014

CONSERVING VALUABLE ECOSYSTEMS

Along with substantial contributions to the policy framework for protecting biodiversity, an enduring element of RESILIM's legacy is its success promoting conservation of specific land areas and species, with the aim of improving resilience by allowing for the continued provision of services within these ecosystems.

Protecting land

DESIGNATING SOUTH AFRICA'S SIXTH BIOSPHERE RESERVE. Water in the Marico River catchment area is so clean that it can be drunk straight from the river, and its protection has been a top environmental priority. With RESILIM assistance, MRCA and local partners in 2015 started the process of designating a U.N. Educational, Scientific, and Cultural Organization biosphere reserve of 60,000 hectares (232 square miles). Further consultation and follow up with land owners in 2016 and 2017 resulted in the expansion of the application as more land owners saw value in being part of a biosphere reserve and subscribed to the proposal. The application, submitted September 30, 2017, now cover 443,968 hectares (1,714 square miles), of which 18,199 hectares (about 70 square miles) will be the core protected area. Thus, RESILIM overachieved significantly on their indicator for land under improved land management for biodiversity conservation (C2.4 - Number of hectares in areas of biological significance and/or natural resources showing improved biophysical conditions as a result of RESILIM program assistance). This area, near Groot Marico in South Africa's North-West Province, includes the Marico Eye, the springs that are the source of the river. Designation as a biosphere will ensure protection of the river and its rich biodiversity — a source of drinking water and irrigation for numerous communities and the Madikwe Game Reserve — and assure socioeconomic benefits through eco-friendly jobs.

PROTECTING WETLANDS. With RESILIM support, a multi-stakeholder group in Zimbabwe created a technical committee to seek protection of Matobo Hills, another important high-altitude catchment area that contributes 8 percent or more of the Basin's total water. In March 2017, RESILIM facilitated a conference of 15 organizations representing government, NGOs, and local communities. The Matobo Conservation Society was charged with spearheading a collaborative effort to designate the area as protected wetlands under the Ramsar Convention, an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands. The technical committee met in September 2017 to identify any gaps in information needed for the Ramsar application and specific members were tasked with obtaining any missing data/information. In the upcoming months the committee will continue to consult with stakeholders to ensure the application is endorsed prior to its submission.

RESTORING MANGROVES AND COASTAL ESTUARIES. Mangroves, which grow in intertidal areas and estuaries, act as a flood buffer and provide critical habitat for plants and animals. In Mozambique, mangroves have declined 30 percent over the last decade due to expanding aquaculture and agriculture, oil, gas, and mineral prospecting, and dammed water courses. During the same period, cyclones, storm surges, and flooding have become more frequent.

RESILIM has been working with CDS-ZC on its mangrove ecosystem restoration program in Xai-Xai, Mozambique. Protection of this land follows a range of RESILIM interventions intended to foster the long-term regeneration and sustainability of the mangrove environment. During the replanting process, 86 hectares (more than 200 acres) were replanted and the mangrove nursery was expanded. A mangrove information resource center was established nearby, accompanied by public education campaigns. An economic valuation determined the value of the mangrove ecosystems to be approximately \$13.3 million annually, data that has encouraged greater interest in protecting mangroves.



Fighting poaching

Poaching, although not explicitly articulated in RESILIM's results areas, is viewed in parts of the Basin as a critical threat to biodiversity. In response, RESILIM added activities that contributed to reducing poaching. These included activities such as livelihoods diversification and CBNRM to address negative socioeconomic conditions that may encourage poaching, as well as direct support to help strengthen enforcement across the Basin.

Much of this work was linked to people living in protected areas in the Great Limpopo Transfrontier Conservation Area (GLTFCA). This area, which borders Kruger National Park in South Africa, Gonarezhou National Park in Zimbabwe, and the Limpopo National Park in Mozambique, is heralded as model for CBNRM. RESILIM's grant to Peace Parks Foundation to support the development of alternative livelihoods there is also aimed at reducing poaching risks. (See Snapshot 2 on page 15.)

INTEGRATING NEXUS APPROACH THINKING INTO NATURAL RESOURCE MANAGEMENT TRAINING. Since 2013, RESILIM worked with SAWC to support activities focused on building the resilience of communities living near parks and in protected areas. These initiatives occurred with communities and through a revision of the college's curriculum:

- *Participatory governance and micro-enterprise development:* SAWC conducted two training activities with community members living in the GLTFCA. The first was a pilot of participatory governance training in Makuleke village in the Pafuri area in northern Kruger National Park in South Africa, which aimed at helping conservation officers engage and empower community members and the local communal property association in effectively driving natural resource management. SAWC developed the training and later integrated it into its curriculum. The second activity helped 82 area women take steps toward building a micro-enterprise based on collection of indigenous plants and insects.
- *Revision of the college's curriculum:* This included first-ever modules on CBNRM, conflict management, and social issues in conservation. Each module was designed to help wildlife officers and park managers working in SADC countries engage communities in protecting natural resources while helping them find financial benefits that would make poaching, deforestation, and other negative practices unnecessary. In 2017, SAWC opened a second campus in a defunct mining area known as Tshikondeni that will be dedicated to this Nexus Approach training.



National parks conservation officers in training at SAWC. A new approach to training links conservation to understanding and addressing the livelihoods needs of people living in and around protected areas.

CREDIT: GIDEON MENDEL

SUPPORTING REGIONAL ACTION ON POACHING. In October 2013, RESILIM teamed with USAID’s Southern Africa Regional Environmental Program to support the establishment of the Wildlife Enforcement Network of Southern Africa. The government of Botswana subsequently agreed to host the group and convened the first SADC summit on elephant management in December 2013. (The SADC region, specifically northern Botswana, is home to the largest concentration of elephants in the world in Africa.) However, securing buy-in and participation of SADC member countries continues to be a challenge, mainly due to lack of a common view on how to manage elephant populations.

In October 2015, RESILIM, in partnership with the U.S. Department of Justice and the U.N. Office of Drugs and Crime, held a regional workshop for prosecutors and magistrates from Angola, Botswana, Malawi, Zambia, Namibia, and Mozambique. Entitled “Combatting Wildlife Trafficking,” its main objective was to build the capacity of legal practitioners, including judges and prosecutors, to better manage and prosecute poaching crimes.

PROMOTING ALTERNATIVE LIVELIHOODS

A fruitful aspect of RESILIM's work was collaboration with local partners on climate change adaptation approaches, particularly those that helped shift local livelihoods opportunities to climate-resilient activities and reduce dependence on rainfed, subsistence agriculture. Some of these partnerships, such as with CDS-ZC on mangrove restoration, did not specifically seek to stimulate livelihoods, but did help create new jobs. (For example, CDS-ZC created new jobs in the mangrove nursery and for replanting.) Other activities centered on identifying, creating, and sustaining economic opportunities for poorer households, such as a partnership with Peace Parks Foundation in developing an integrated livelihoods diversification strategy and conservation and development framework for communities in the GLTFCA. (See Snapshot 2, page 15.) Other examples include:

People here have very few opportunities to earn a living. If we do not find ways for them to benefit financially from conservation, we will have no success protecting the river and the catchment.

— Daan van der Merwe, MRCA
Managing Director

CAPITALIZING ON DROUGHT-TOLERANT FLORA. The aim of this collaboration with the Kalahari Conservation Society and Kgetsi ya Tsie (KYT), a women's cooperative in Eastern Botswana that depends on natural resources enterprises for livelihoods, was to strengthen and sustain the production of cosmetics and foods from the fruit of the marula tree, a native species that is expected to thrive in the projected hotter, drier conditions. Prior to RESILIM support, the quality of the marula oil was not adequate for the international market. RESILIM provided technical assistance on quality assurance, improved machinery (e.g., a new centrifuge), and skills-building through a technical exchange with a company doing similar work in Swaziland. As a result, KYT is now better capacitated to deliver quality marula products through improved hygienical processes and adherence to standards. RESILIM further supported KYT to attend a workshop on veld resources. At this workshop an association was created to drive further research and the development of an economically sound and environmentally sustainable natural products industry.

PREPARING FOR THE THREAT OF MORE FIRES. With MRCA, RESILIM supported certification-level training and the purchase of equipment to outfit a new team of 70 male and female firefighters in Groot Marico in South Africa's North-West Province. Bushfires claim approximately 15,000 hectares (60 square miles) there every year, and are expected to become more common due to climate change. This results in major economic losses of grazing for livestock and game, physical property, and even human lives: In 2011, a local farmer and farm worker died battling a fire.



These Batswana women have found new climate-friendly jobs based on the sale of cosmetics and foods made from the marula, a native tree that is expected to thrive in dry conditions. As part of RESILIM's effort to demonstrate scalable adaptation approaches, the program provided support to their employer, KYT, in strengthening operations of the women-dominated enterprise.



Men and women participate in firefighting training in Groot Marico in South Africa's North-West Province, an example of a scalable adaptation project that helped create climate-friendly jobs.

SNAPSHOT 2

CONSERVATION THAT WORKS FOR ALL

Economic opportunities for people in protected areas yield returns in conservation and biodiversity.



PHOTO: RESILIM

To explain how and why the livelihoods diversification strategy was developed, RESILIM produced a short video, available at: <https://vimeo.com/172404624>

“One of the key issues is that if communities don’t have options, they will do anything to survive the day. We are trying to help them develop options, so they can make good decisions.”

**— Lewis Rukurumune,
GLTFCA Advisor and Climate Specialist**

Imagine an area as big as Maryland where elephants, lions, and rhinos roam free. This is the ambition of the Great Limpopo Transfrontier Park, 3.6 million hectares where the borders of Mozambique, South Africa, and Zimbabwe meet.

The 15-year-old effort is led by the Joint Management Board of the Great Limpopo Transfrontier Conservation Area (GLTFCA), in partnership with Peace Parks Foundation. Its goal is to consolidate Kruger, Gonarezhou, and Bahine/Limpopo national parks, private reserves, and communal areas into an area free of human barriers.

However, the 2.5 million people living in the GLTFCA buffer zone face high unemployment and poverty, and often rely on rainfed agriculture and government handouts. They are vulnerable to climate change impacts, especially floods and droughts, and most do not see benefits from conservation. Wildlife trafficking and poaching persists.

The challenge is clear: The viability of the conservation area depends on these communities achieving economic stability and social well-being.

Along with support to Southern African Wildlife College to strengthen community-based natural resource management, RESILIM partnered with Peace Parks Foundation in 2014 on a strategy to improve the livelihoods of people in the GLTFCA. The goal is two-fold: ensure communities derive benefits from protected areas and increase their resilience to climate change.

The centerpiece activity was the development of a far-reaching livelihoods diversification strategy. Adopted by GLTFCA leadership, it is being implemented in communities across the protected area.

BUILDING PUBLIC INVESTMENT IN THE NEXUS APPROACH

At the same time that RESILIM sought to operationalize the Nexus Approach through policies, frameworks, and institutional arrangements, it also worked to spark public dialogue and expand grassroots awareness of the need for action on water, biodiversity, and climate. By participating in major public events, producing and distributing communications materials, providing grants to organizations conducting public education, and appearing in traditional and social media, RESILIM reinforced its work with governments and key influencers with activities that generated public interest in related issues. The effect was to expand the community of allies for these issues and motivate a new generation of leaders. This strategic work emphasized activities that would reinforce other program work and a focus on youth. Examples include:

ENGAGING THE GROOT MARICO COMMUNITY.

With MRCA, RESILIM supported two Conservation in Resilience Youth Camps in 2015, reaching more than 220 students from the Groot Marico community. Some students went on to lead a door-to-door awareness campaign on World Water Day 2015 that reached 600 people. While these activities inspired a new generation, they also helped educate the public on home-based water conservation and garnered interest in and support for the proposed Marico Biosphere Reserve.

INVESTING IN FUTURE MANGROVE

CONSERVATION. While supporting technical work to map, value, and replant mangroves, RESILIM and CDS-ZC also invested in several youth-specific activities in Mozambique, including creating a mangrove education center and local and national education programs to build awareness of the importance of mangroves now and in the future. The education activities included a series of youth tours, as well as the launch of the BIOFUND, a trust that will play a major role in supporting the conservation of the country's landscapes. CDS-ZC led education sessions and distributed materials on mangrove conservation to key players. At one event, held at the mangrove rehabilitation demonstration site in Xai, they reached 500 youth, many of them from Maputo.



Below are other examples of how RESILIM sought to build public awareness.

Communications materials

With one full-time communications specialist and support from partner Overseas Strategic Consulting, RESILIM produced a diverse library of technical and non-technical materials aimed at educating decision-makers, key influencers, program partners, and the public on water, biodiversity, and climate change. Guided by the program's communications and knowledge management strategies, the team promoted these materials on social media, distributed them at workshops, conferences, and other events, and published them on websites such as Climatelinks.org. These materials fell roughly into two categories:

COLLATERAL MATERIAL FOR TECHNICAL PUBLICATIONS. Drawing on publications such as the [R+V Report](#), the [Limpopo River Basin Disaster Preparedness Action Plan](#), and the [Basin Investment Strategy](#), which detailed how government, the private sector, donors, and other development agencies could collaborate to reduce vulnerability to climate change and increase the system's resilience, the team produced a series of supplemental materials in plain language to help busy and/or non-technical audiences quickly digest key findings. Examples include:

- Six briefing notes on technical issues related to [water allocation](#), [environmental flows](#), [effluents treatment](#), [water hyacinth](#), [flood preparedness](#), and [mangroves](#)
- Eight colorful, accessible, one-page [case studies](#) and a poster on the eight Resilience Action Areas described in the *R+V report*
- [PowerPoint, speaker notes, and guidance for a “road show” presentation](#) on the Basin Investment Strategy

ORIGINAL MATERIAL. The team drew on program activities to create a wide range of materials in different formats, including:

- A series of 10 short videos about key resilience-related issues, promoted on Facebook and Vimeo and shared at events. These featured topics such as the KYT marula project to highlight climate-friendly livelihoods adaptation; the CDS-ZC mangrove project to explain ecosystem protection; and an exploration of “What Makes a Resilient River Basin?” The videos are available at: <https://vimeo.com/search?q=RESILIM>
- [Comic books](#) (three in English and one in Portuguese) on [water conservation](#) and mangroves, distributed to hundreds of people in Mozambique, Botswana, and South Africa at public events such as World Water Day

Grassroots awareness

Through its grants, RESILIM supported valuable education and outreach activities at the community level. These included a partnership with the Tati River Management Committee, a group of community leaders, government officials, businesses, and others in and around Francistown, Botswana, that were interested in reclaiming degraded and polluted areas of the Tati River. Efforts to educate the public included:

RIVER CLEAN-UP PROJECTS. RESILIM worked with the Matsila Community Trust on a clean-up at South Africa’s Blood River, a tributary to the Limpopo, and the initiative was replicated with the Tati River Management Committee on a similar event for the Tati River, also a Limpopo tributary in Botswana. These daylong events included training for local women and a public event with local government leaders that drew media attention.

EDUCATING YOUTH. In partnership with the Kwalata Community Development Initiative, RESILIM supported several activities that targeted youth:

- A 2014 Science for Resilience Expo, where 1,800 high school students participated in lectures, presentations, and interactive exhibitions. Features created for the event (and presented many times after) included a model of the Limpopo River Basin.
- A Student Scientific Careers Week in March 2017 at the Tswaing Crater Museum in Pretoria brought 600 students together to inspire them to careers in science.



Traditional and social media

Along with a range of feature stories and photos, RESILIM had several high-profile media appearances that likely reached tens of thousands of people. Examples include:

TV SERIES. With Matsila Community Trust, RESILIM supported *It's for Life*, a television series that featured climate change impacts on rural communities, resilience-building, and the value of traditional knowledge. The shows were broadcast in March 2014 across South Africa on SABC 2, a television channel owned by the South African Broadcasting Corporation, and in other Basin countries through M-Net, a South Africa-based subscription television service.

TALK SHOW. RESILIM appeared on the educational talk show *Shift* on SABC 2 to discuss its support for Adopt-A-River program activities in South Africa's Blood River area, as well as plans for similar activities with the Tati River in Botswana. More than 500,000 people watched the show.

PODCAST. RESILIM staff were interviewed by the Inter Press Service News Agency about the challenges Basin communities face with water availability, disparities in water usage in the Basin's four riparian countries (i.e., those countries that host portions of the catchment or basin), and the work of RESILIM. The podcast is available at: <http://www.ipsnews.net/2014/01/limpopo-river-basin-many-rivers-enough-water/>.

FACEBOOK. Because USAID preferred that RESILIM did not develop its own website, the program used Facebook as its main forum for publicizing events and research, sharing videos about activities, and re-posting compelling content related to resilience and Nexus Approach issues. With nearly 250 followers, the Facebook page helped RESILIM extend its reach. During the four-day 2015 Africa Rising conference in Cape Town, South Africa, RESILIM staff and other attendees created an online event by posting live comments and photos using the hashtag "Africa Rising."

Events

RESILIM staff and partners participated in many events related to Nexus Approach issues. These included public events, conferences, and policy forums at which RESILIM set up promotional booths. These events reached hundreds of attendees, as well as thousands more who saw media coverage. Examples include:

- Save the Rhino, March 2013.
- National Water Week, South Africa, March 2014, 2015, and 2016. In 2017, this cooperation culminated in co-sponsorship of the 2017 World Water Day Summit and Expo in Durban, South Africa, hosted by the government of South Africa and United Nations to launch the 2017 edition of the U.N. World Water Development Report, *Wastewater: The Untapped Resource*. South African President Jacob Zuma launched the report with deputy director-general of the U.N. Educational, Scientific, and Cultural Organization. A RESILIM staff member presented the *Limpopo River Basin Disaster Preparedness Action Plan*.
- World Water Day, Botswana, 2015.
- Forestry Conservation Congress, Durban, South Africa, 2015.
- SADC Annual River Basin Organization Stakeholders Forum, annual.
- Africa Rising: Biodiversity Data and Information, Cape Town, South Africa, 2015.
- Southern Africa Society for Disaster Reduction Symposium, Victoria Falls, Zimbabwe, 2016.
- Resilience Colloquium Conference, Johannesburg, South Africa, 2017.



Young people near Xai-Xai, Mozambique, learn about mangroves and other coastal habitats at an event sponsored by RESILIM partner CDS-ZC. Such grassroots education efforts were part of RESILIM's work to build a community of practice around resilience.

CREDIT: CDS-ZC

FLYING HIGH FOR WATER BELOW

An aquifer straddling the border of Botswana and South Africa is the focus of a new trans-boundary effort to secure water.



PHOTO: Karen Villholth, IWMI-South Africa

Following a desk review of available data and analysis, additional hydrological data on the Ramotswa Aquifer was gathered by aerial geospatial sensing using electromagnetic signals generated by a device connected to the landing skids of a helicopter.

“The broader significance [of this work] should not be taken lightly, as groundwater resources are playing an increasingly important role in the drive for resilience and sustainable development in Africa.”

— Jonathan Lautze, IWMI

Eager to find new water sources for a thirsty future, the governments of Botswana and South Africa are breaking new scientific and political ground by working together to explore a shared water resource: the Ramotswa Aquifer.

Supported by RESILIM and several technical partners, including IWMI, the initiative is part technical, part political. The partners are helping the governments forge a series of water sharing agreements and a plan for managing the aquifer, as well as conducting a thorough scientific and technical investigation of the aquifer.

Activities include a transboundary diagnostic analysis comprising a gender-focused socioeconomic baseline and institutional assessment; a strategic action plan for both governments on development and management of the aquifer; a joint Geographic Information System-integrated information management system of physical and socioeconomic data and maps; and training materials.

The first of its kind in the SADC region, the initiative has drawn attention, particularly in two other areas of the Basin with transboundary aquifers, the Pafuri Triangle Aquifer (shared by Mozambique, South Africa, and Zimbabwe) and the more extensive Tuli Karoo Basin Aquifer (shared by Botswana, South Africa, and Zimbabwe). Success in developing tools and guidelines and learning practical implementation lessons is likely to be replicated in these areas.

Work on the Ramotswa Aquifer is important not only for the potential long-term benefits to the two countries, but also because it has demonstrated how cooperation and joint bilateral management can yield better outcomes than a nationally centered, “go-it-alone” approach.

3. SUMMARY OF OTHER PROGRAM FEATURES

DRAWING ON USAID FORWARD: EMBRACING PARTNERSHIPS

RESILIM leadership focused on integrating partnerships into nearly every aspect of program activities. This included close interaction with LIMCOM and SADC leadership on the program's strategic direction and implementation. Engagement of consortium partners, counterparts in government and civil society, and others added rich perspectives and created new platforms for sharing RESILIM information and knowledge on water, biodiversity, and climate.

Grants were also invaluable for partnerships. Seven RESILIM grants facilitated work at the community level on livelihoods and climate change adaptation, resulting in a set of Basin-specific experiences to guide future work on resilience-building. The grants delivered key program results and helped generate attention to viable opportunities for scalable adaptation activities. The grants had two other important features consistent with USAID Forward: leveraged partner contributions and strong capacity building.

LEVERAGING CONTRIBUTIONS

RESILIM sought to leverage contributions to help ensure partners developed a diversity of funding sources and/or maintained financial independence. The target for the life of the five-year program was \$840,000; this was exceeded by 7 percent, for a total of \$895,231. Table 2 below summarizes these contributions.

TABLE 2: RESILIM GRANTEE AND SUBCONTRACTOR CONTRIBUTIONS TO ACTIVITIES				
PARTNER	YEAR OF CONTRIBUTION	ACTIVITY	RESILIM CONTRIBUTION	PARTNER CONTRIBUTION
SANBI (Africa Rising)	2015	Conference	1,597	436,845
CDS-ZC	2014/2016	Mangrove mapping	180,303	28,277
GWPSA	2016	Limpopo Atlas	95,876	17,245
GRID-Arendal	2016	Limpopo Atlas		19,025
Hwange GLTFCA	2014	Conference	12,006	14,000
IGRAC	2016	Ramotswa Info. Mgt. System	49,800	12,400
IWMI	2015	Ramotswa mapping, planning, data tools	420,563	78,390
Kwalata Community Development Initiative	2015	Youth Education	28,478	34,311
MRCA	2016	Training + biosphere reserve application	41,265	24,266

TABLE 2: RESILIM GRANTEE AND SUBCONTRACTOR CONTRIBUTIONS TO ACTIVITIES

PARTNER	YEAR OF CONTRIBUTION	ACTIVITY	RESILIM CONTRIBUTION	PARTNER CONTRIBUTION
Peace Parks Foundation	2015/2016	Livelihoods — GLTFCA	155,443	173,894
South African Dept. of Environmental Affairs	2016	Workshop	0	3,458
SAWC	2014	Curriculum revision	135,808	53,122
TOTAL			1,121,140	895,232

CAPACITY BUILDING

All RESILIM grant agreements included an element of capacity building aimed at helping the partner develop skills to increase its technical and management capacity. Initially RESILIM would assess the capacity needs of a potential grantee to deliver certain products on behalf of RESILIM. Based on the strengths and weaknesses identified, RESILIM would incorporate institutional capacity building and skills development in the grant. For example, RESILIM supported CDS-ZC to develop their skills in report writing by having a communications consultant work closely with the organization's communication specialist to develop the organization's reporting skills. RESILIM also provided training to CDS-ZC to improve their skills in the development of funding proposals. Another example includes RESILIM providing training to KYT in business planning. They are now able to calculate the cost of production, outline the process of the marula oil production method and possible production targets and determine the economic feasibility of ongoing trade.

"Because of the systems we now have in place, we have much greater opportunity to access resources in the future — and to manage them well."

— Charl Pretorius, Kwalata Community Development Initiative

PUBLIC-PRIVATE PARTNERSHIPS

As part of its strong partnership approach, RESILIM sought to engage private sector interests. The most prominent effort was the development of the Basin Investment Strategy, a document produced by OneWorld to map ways in which government, the private sector, donors, and other development agencies could collaborate in using their resources to reduce vulnerability to climate change and increase resilience. Grantees were another channel for collaborating with the private sector. For example:

- The Kwalata Community Development Initiative frequently collaborated with companies for sponsorship and to represent its perspective on resilience issues. For example, Nestlé took part in the Science for Resilience Expo (see p. 17), hosting a session on its efforts to conserve water through its supply chain.
- RESILIM helped the Kalahari Conservation Society connect with private sector companies around capacity building and joint ventures, including Debswana (DeBeers and Botswana Diamond Mining company), Classic Woods, and Selebi-Phikwe Economic Diversification Unit. Meetings aimed at supporting livelihoods initiatives with KYT, the women's cooperative in Eastern Botswana. Debswana

and the Economic Diversification Unit are currently providing additional resources to further enhance the capacity of the KYT to better deliver on natural resources products.

GENDER AND MARGINALIZED POPULATIONS

RESILIM grants were particularly effective in developing programs to reach women and youth. This included direct support to women's and youth groups, such as KYT and the Kwalata Community Development Initiative, as well as capacity building through training, outreach, and communications, especially at the community level. Illustrative facts include:

- Of the 4,435 people who increased their ability to adapt to climate change as a result of RESILIM support, 52 percent were female and 45 percent were youth.
- Of the nearly 2,000 youth included in the 4,435 with increased capacity, more than half were young girls. The activities RESILIM supported, including the Science for Expo and Tswaing Meteorite Crater Careers Day, helped foster participants' interest in science, technology, engineering, and mathematics.
- Targeted support to women ranged from highly technical scientific and management skills (e.g., monitoring environmental flows, analyzing groundwater data, and managing disaster risk) to basic education and awareness-raising on topics such as climate change impacts and home water conservation.
- RESILIM partnered with KYT and SAWC on livelihoods-related training that targeted only women, but a number of community-level initiatives (e.g., collaboration with Matsila village and the Tati River Management Committee on river clean-ups and CDS-ZC on mangrove awareness) heavily favored the engagement of women. For example, the ratio of women to men participating in the mangrove education campaign was 5-1; on the Matsila clean-up, it was 3-1.
- Training also included non-traditional livelihoods for females, such as bush firefighting.

INDIGENOUS KNOWLEDGE. In addition to the emphasis on women and youth, RESILIM represented indigenous populations through the integration of their knowledge. Consideration and integration of indigenous knowledge was a priority at the policy level (e.g., in RESILIM's work on the *Limpopo River Basin Disaster Preparedness Action Plan*), but it was also built practically into partner activities. A prime example is the SAWC training mentioned above, which built on local knowledge and practices to help 82 women take steps toward building a micro-enterprise based on collection of indigenous plants and insects. Although the women (and sometimes children) typically collect these plants and insects for their own food and medical use, the RESILIM-supported training helped them consider strategies for sustainably harvesting and selling them. Innovative approaches such as these, linked conservation of natural resources with the development of climate-friendly livelihoods.



Students outside Pretoria take part in a RESILIM-sponsored program that helped them learn how to monitor water quality in the streams that flow through their communities. RESILIM programs focused on youth whenever possible.

CREDIT: LARA RALL, RESILIM

SMALL BUSINESS PARTNERSHIPS

RESILIM's use of U.S.-owned small businesses exceeded the life-of-project target by 207 percent, or \$339,231. By the first quarter of fiscal year 2016, RESILIM had already achieved 97 percent of its small business utilization goal. The program goal was \$315,736; the total amount expended was \$654,967.

In fiscal year 2016, \$98,815 of RESILIM's overall small business utilization was incurred through subcontractor Overseas Strategic Consulting's communication products and knowledge management, as well as subcontractor XRI Holdings LLC on hydrogeological surveying and data analysis of the Ramotswa Aquifer. With partners IWMI and IGRAC, XRI worked with RESILIM to deliver innovative data and analysis on ground water resources.

Another significant subcontract partner, Caudill Web, created a DevResults database to serve as a central tracking system, a communications tool, and an information repository. This Geographic Information System-based Web platform supported financial and compliance tracking of grants and subcontracts, enhanced data collection, and analyzed progress toward RESILIM's results framework and work plan.

RESILIM consistently received "very good" ratings on small business utilization from USAID, which remarked that RESILIM's activity in this area was "relevant and appropriate to the program."

4. PROBLEMS ENCOUNTERED: SOLUTIONS AND LESSONS LEARNED

CHALLENGES CONFRONTED

RESILIM implementation was inherently complex given its geographic scale and the context of the social and political diversity in the Basin. The program faced challenges its original design did not foresee; in most cases, the team was able to adapt course, revise plans, and find new opportunities to continue delivering on RESILIM's goals and objectives. A few of these challenges are discussed below.

ORIGINAL LOCATION OF THE PROGRAM IN MOZAMBIQUE. Although there were sound reasons to locate RESILIM's main office in Maputo, where LIMCOM is headquartered, logistical and administrative challenges created difficulties. Running costs were very high, registering as a legally recognized entity was complicated and time-consuming, and unreliable communications infrastructure made startup difficult. Once relocated to Pretoria, South Africa, the RESILIM team was able to operate more smoothly and collaborate more effectively with all of the member governments.

RECONFIGURATION OF THE CONSORTIUM. Partner IUCN dropped out shortly after startup, citing its discomfort with some of the required contracting and administrative arrangements. Other partners periodically expressed frustration with these arrangements during implementation, but remained in the consortium. Although losing IUCN as a day-to-day partner was a blow, it remained a key stakeholder and collaborator. For example, RESILIM supported IUCN's participation in the 2016 World Conservation Congress, and IUCN facilitated the environmental flows training in Cape Town, South Africa, in 2016.

CHALLENGES WITH LIMCOM. RESILIM was unable to provide LIMCOM with the expansive capacity building support originally envisioned in the program design, primarily due to the limited engagement of member countries: While some were active, others did not regularly participate in and support LIMCOM processes. This made it impossible for the LIMCOM secretariat to become operational or fully execute its mandate. With very little technical staff and a part-time executive secretary through 2016, LIMCOM was not able to work with RESILIM to build the capacity of its secretariat.

SYSTEMATIC APPROACH TO KNOWLEDGE MANAGEMENT. Although RESILIM produced excellent knowledge management and communications materials on lessons learned and best practices, these were not shared as widely as hoped. One reason was the challenge of physical distribution across a huge geographic area with low internet connectivity another was the lack of existing Basin-specific communications platforms, which was exacerbated by the absence of a program website. Even so, the team worked hard to leverage dozens of conferences, workshops, and other events to distribute materials, as well as Facebook and USAID platforms such as Climatelinks. RESILIM staff also worked diligently with partners to ensure information was being shared.

STAKEHOLDER AND PARTNER RELUCTANCE TO SHARE DATA AND INFORMATION. At the initial stages of implementation, some Basin stakeholders and partners were hesitant to share data and information on natural resources. This was resolved in most cases through dedicated efforts to build trust and draft clear data-sharing protocols. An example was RESILIM's support of the JPTC, which required several meetings of key stakeholders to reach agreement on common goals related to water management, backed up by a strong protocol for exactly what information would be shared, who would share it, and how.

CLOSING THE TECHNOLOGY AND DATA GAP. The challenging data-sharing situation was aggravated by difficult access to reliable, fast Internet connections. In addition, the rapid pace of technological developments in water engineering and environmental science made it difficult for partners to stay up to date with technical skills. This was particularly challenging because some partners lacked even basic technical skills.

LESSONS FOR FUTURE PROGRAMS

RESILIM staff and partners reported many lessons learned, all of which are certain to benefit individuals and institutions in the future.

“The partnership with RESILIM was very well-received, as it is perceived of being truly in support of GLTFCA objectives and priorities. RESILIM was also open to changes in the project scope and budget, which often occur in stakeholder-driven processes such as the GLTFCA Integrated Livelihoods Strategy initiative.”

— Piet Theron, Peace Parks Foundation

INSIGHTS ON RESILIENCE

Governments, development practitioners, and others can benefit from RESILIM's experience seeking to enhance and build resilience. A few of the lessons learned are discussed below.

PREREQUISITES FOR EFFECTIVE RESILIENCE-BUILDING. Prerequisites include democratic and accountable governance; awareness and knowledge management systems; a motivated private sector; organizational and institutional capacity and visionary leadership; and socioeconomic incentives centered around communal natural resources.

LONG-TERM COMMITMENT. The effort to enhance or build resilience of people and ecosystems must be considered a long-term process, not an end in itself that can be addressed in a set timeframe (e.g., a five-year program such as RESILIM). The mainstreaming of resilience thinking, along with related practical development approaches, will also be lengthy and difficult. And because the application of this thinking is novel, it is sometimes poorly articulated and communicated, even by those meant to champion it. (This in itself can be a major barrier.) Nonetheless, resilience is fundamental to achieving sustainable development.

LONG-TERM EFFORTS ON MONITORING, EVALUATION, AND LEARNING. Short-term measurements are nearly impossible in resilience-building activities. While some level of success may be evident during the life of a project, the impact should be measured for years afterwards. For example, in the five years of the RESILIM program, RESILIM was not able to find evidence for the program indicator that measures the number of people with increased socioeconomic benefits derived from sustainable natural resources management and conservation. To track such an indicator would require more robust socioeconomic parameters, with properly set baselines in the 1st Year the program and monitoring mechanisms linked to e.g. national evaluation tools for poverty and rural development. It was decided, together with USAID, to stop tracking this indicator. However, the foundation that the RESILIM program laid out in five years will go a long way in providing a sustainable baseline for increased socioeconomic benefits derived from natural resources management.

POLITICAL COMMITMENT IS KEY TO SUSTAINABILITY. Given the time required to build resilience, governments are best positioned to drive progress and monitor results. In the context of the Basin, continuous commitment and political will of the four riparian governments is indispensable to holding institutions accountable, maintaining momentum, and ensuring the consistency and relevance of interventions. In fact, their engagement is the essential ingredient for sustainability.

OTHER KEY LESSONS

FLEXIBILITY AND ADAPTABILITY. Both RESILIM and USAID embraced flexibility and adaptability in program management. This enabled RESILIM to adjust plans and take advantage of opportunities as they arose. For example, as LIMCOM activities were at a lower level of effort than first envisioned, the team, in consultation with USAID, was able to pivot quickly to identify new operational modalities, including bilateral government activities such as with the JPTC and the multi-stakeholder collaboration characterized by RESILIM's work with SAWC, Peace Parks Foundations, and others around the GLTFCA.

STRONG RELATIONSHIPS. Given RESILIM's geographic scope and the political complexities of four sovereign nations trying to work together, trust and understanding of the program and among partners was vital to success. The rewards came only through repeated consultations and meetings, investments in networking, genuine efforts to listen to and respond to the needs of others, and consistency and reliability in the provision of support. RESILIM involved a wide range of stakeholders to build resilience. The improved stakeholder dynamics included:

- Enhanced the sense of ownership and custodianship
- Encouraged knowledge parity and trust among groups that often have conflicts over resources
- Catalyzed more productive joint management rather than "command and control" approaches
- Created space for two or more social actors to negotiate, define, and guarantee among themselves a fair sharing of the management functions, entitlements, and responsibilities for a given territory or set of natural resources
- Expanded experiences in participatory processes, with engagement across governmental and non-governmental actors, as well as local and community institutions and stakeholders

ADD VALUE BY COLLABORATING WITH EXISTING INSTITUTIONS. One of the keys to RESILIM success was its focus on developing relationships and partners with existing institutions and programs rather than trying to create new activities. This approach enabled RESILIM to add value and inject new energy into its activities. Importantly, it also avoided creating overlapping or competing initiatives that could have reduced the effectiveness of all involved, undermined existing institutions mandated to manage or conduct activities, and consumed scarce resources. RESILIM found benefits to this approach in several different circumstances:

- At the community level, participation of existing institutions greatly strengthened the willingness of different segments of the community to accept and participate in implementation of activities.
- Working with institutions that had already conducted a capacity needs assessment and related capacity building plans.
- The involvement of existing institutions was imperative when a goal was the pursuit of power-shifting and/or control of use and ownership of natural resources at the community level.

BALANCING INDIGENOUS KNOWLEDGE WITH MODERN SCIENCE ON NATURAL RESOURCES. Conflicts that emanate from the interpretation, understanding, and application of indigenous knowledge systems versus modern natural resource concepts can be minimized by documenting information on natural resources using both modalities and engaging stakeholders in harmonizing the information.



Counterparts from South Africa's and Botswana's national departments of water collaborate on plans to conduct joint monitoring of the Upper Limpopo River.

CREDIT: LARA RALL, RESILIM

5. THE ROAD AHEAD

Although RESILIM had a significant, measurable impact building the resilience of the Limpopo River Basin, its people, and its ecosystems, challenges remain—and the effort must continue. Ongoing critical risks include:

- Increasing external development pressures on water extraction, tourism, and other sectors/activities may exceed current baseline projections and send the Basin in a downward spiral beyond its tipping points.
- The four riparian countries may fail to reach consensus and/or a common vision on water sharing arrangements due to competing interests.
- LIMCOM may continue to be slow to deliver its mandate due to lack of leadership and support from government and other key players.

Strategies for addressing these risks, based on recommendations from RESILIM partners, are detailed below.

TRANSBOUNDARY WATER MANAGEMENT IS STILL A PRIORITY

Because water flows and other natural resources are not always confined within a single country's borders, continued efforts are needed to build and strengthen transboundary arrangements. Focus areas might include efforts to formalize protection of high-altitude catchment areas and collaborative work on transboundary aquifers. With the current situation and future projections of water scarcity, sustainable use of these water sources is central to the Basin's economic and social vitality.

As part of this work, continuous investment must be made in the scientific evidence base, particularly in filling data gaps, many of which are considerable, especially for data on integrated surface and groundwater management.

COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT IS THE WAVE OF THE FUTURE

CBNRM approaches, as evidenced by action around the GLTFCA, are the wave of the future. GLTFCA — a union of three governments, three national parks, and numerous communities in the conservation area — is a conservation success story. Still, more needs to be done to strengthen community structures, such as communal property associations to represent communities and make decisions about how benefits are shared. When these structures are weak, theft, corruption, and poor legal compliance can result and poaching may increase. Successful CBNRM requires an investment in communities' capacity. Partners at Peace Parks Foundation see an urgent need to focus on practical efforts to promote socioeconomic development in the conservation area.

"A key learning [from the Ramotswa work] is that transboundary cooperation to meet regional and national water goals must include consideration of groundwater, something that has traditionally not been done in Southern Africa. In addition, solutions for water security need to be found at the intersection of various water sources, such as groundwater, surface water, and 'new' water, such as reclaimed wastewater. Only by integrating the various sources can comprehensive and resilient solutions be found. Because of the systems we now have in place, we have much greater opportunity to access resources in the future — and to manage them well."

— Jonathan Lautze, IWMI



A ranger surveys an escarpment in the Greater Limpopo Transfrontier Park. The 15-year effort to establish a conservation area spanning national parks on the borders of Mozambique, South Africa, and Zimbabwe and surrounding communities has been hailed as a model in CBNRM. RESILIM, with partner Peace Parks Foundation, has supported efforts to strengthen climate-resilient livelihoods in the conservation area.

CREDIT: GIDEON MENDEL

INVESTMENTS IN LEADERSHIP MATTER

Strong leadership remains a key factor of success across the Basin. Continued investment in enhancing leadership is integral to the success of Basin organizations across the SADC region. These investments must also align with efforts to strengthen governance more broadly, particularly for implementation and oversight of policies related to climate, water, and biodiversity.

RESEARCH AND EVALUATION MUST CONTINUE

Continued investments in research, monitoring, evaluation, and learning are essential to the management of a shared resource such as the Basin. It is critical to continue generating and sharing information and data to inform policy and guide decision-making on crosscutting issues. These efforts must include primary and secondary data collection and analysis on environmental and socioeconomic drivers and impacts, as well as monitoring, evaluation, and learning on a range of interventions, including policy implementation, development interventions, and community action. The availability of accessible, high-quality data and information will promote coordinated, integrated, and inter-disciplinary approaches to building resilience of people and ecosystems across the Basin.

TECHNICAL SKILLS-BUILDING IS VITAL

Technical capacity enhancement will be required in many areas, including environmental flows, transboundary water governance, climate science and adaptation, hydrology, and information systems management. In addition, continued support is needed in standardizing data collection and management methodologies across the four countries.

ANNEX A. ACHIEVEMENT OF PROJECT RESULTS²

2

During the course of implementation, the original M&E plan was reviewed, as some indicators were considered to be closely related and virtually measuring the same thing which increased the possibility of double-counting and making it difficult to narrate the resilience building story with robust support from the indicators. As a result, it was proposed that, when reporting on performance, similar indicators are consolidated under one indicator while ensuring disaggregation that reflects the rolled-up indicators. If an indicator pointed to something rather unique, it remained a separate (unique) indicator. This was proposed with a view to minimally change the original structuring of the indicators, with no actual new indicators being included in the M&E Plan. Three (3) consolidated indicators, meant specifically for purposes of presentation to USAID, were decided upon (see table below) with a view to enhance the ability of RESILIM to do the following:

- i) To tell the resilience building story better
- ii) To minimize double-counting across indicators and KRAs
- iii) To avoid re-interpretation (versus knowing) of what an indicator really means

Consolidated Indicator	Indicators Included	Remarks
C1.1 Number of people with increased adaptive capacity to cope with impacts of climate variability and change as a result of project assistance	C1.5, C1.6, C2.3, C3.1, C3.2	Includes a count specific to 1.1 as well as roll-up indicators. The roll-up will not supersede tracking and reporting on the individual indicators
Number of agreements, tools and strategies promoting an enabling environment for resilience that are officially proposed, adopted or implemented by stakeholders as a result of RESILIM program support	C1.7, C2.2, C2.5, C3.4	The roll-up will not supersede tracking and reporting on the individual indicators. This is to ensure that we do not lose the story of progress by technical sector
Number of technical reports / assessments developed to promote improved resilience as a result of RESILIM program assistance	C1.3 and C2.1	Disaggregation (specifically study, assessment and sector) was also re-considered/redefined to eliminate elements of double counting

OVERVIEW OF MONITORING AND EVALUATION					
KEY RESULT AREA	PERFORMANCE INDICATORS	LIFE-OF-PROJECT TARGET	CUMULATIVE TOTAL AS OF MAR. 31, 2017	% OF TARGET REACHED	REMARKS ON % OF TARGET REACHED
	P1.1 Number of target population with increased socioeconomic benefits derived from sustainable natural resources management and conservation as result of RESILIM program assistance	5,000	0	0%	It proved during implementation that long-term measurements from baseline are necessary for conclusive impact to be drawn. As a result it was decided, together with USAID, to stop tracking this indicator.
	P1.2 Amount of investment leveraged from private and public sector partners for climate change and biodiversity conservation as a result of RESILIM program assistance	\$840,000	\$895,231.26	107%	
KRA 1.1. Science, technology, and capacity for decision-making and development of climate change adaptation strategies improved	C1.1 Number of people with increased adaptive capacity to cope with impacts of climate variability as a result of RESILIM program assistance	5,000	4,846	97%	Roll up of C1.1, C1.5, C1.6, C2.3, C3.1, C3.2
	C1.2 Number of institutions with improved capacity to address climate change adaptation issues as a result of RESILIM program assistance	40	58	145%	
	C1.3 Number of scientific studies/technical reports published or conference presentations given as a result of the RESILM program	17	25	147%	Part of a roll-up indicator comprising of C1.3 and C2.1 The roll-up indicator (C1.3 and C3.4) is: Number of technical reports / assessments developed to promote improved resilience as a result of RESILIM program assistance

OVERVIEW OF MONITORING AND EVALUATION					
KEY RESULT AREA	PERFORMANCE INDICATORS	LIFE-OF-PROJECT TARGET	CUMULATIVE TOTAL AS OF MAR. 31, 2017	% OF TARGET REACHED	REMARKS ON % OF TARGET REACHED
	C1.4 Number of scalable climate change adaptation projects piloted in the basin as a result of RESILIM program support	15	17	113%	
KRA 1.2. Water conservation and water demand management responding to climate change improved	C1.5 Number of stakeholders trained in water conservation and water demand management	510	392	77%	Part of roll-up indicator C1.1, comprised of C1.5, C1.6, C2.3, C3.1, C3.2
	C1.6 Number of stakeholder groups/teams implementing risk-reducing practices/actions to improve water conservation and water demand management as a result of RESILIM program assistance	510	497	97%	Part of roll-up indicator C1.1, comprised of C1.5, C1.6, C2.3, C3.1, C3.2.
KRA 1.3. Integration of climate change adaptation strategies into long-term management plans and policies increased	C1.7 Number of climate change adaptation strategies approved or adopted by stakeholder groups as a result of RESILIM program support	4	4	100%	Part of a roll-up indicator comprising of C1.7, C2.2, C2.5, C3.4 The roll-up indicator (C1.7, C2.2, C2.5, C3.4) is: Number of agreements, tools and strategies promoting an enabling environment for resilience that are officially proposed, adopted or implemented by stakeholders as a result of RESILIM program support
KRA 2.1. Natural resource management practices that mitigate threats to biodiversity improved	C2.1 Number of assessments on conservation and management of ecosystems conducted as a result of RESILIM program assistance	6	9	150%	Part of a roll-up indicator comprising of C1.3 and C2.1 The roll-up indicator (C1.3 and C3.4) is: Number of technical reports / assessments developed to promote improved resilience as a result of RESILIM program assistance

OVERVIEW OF MONITORING AND EVALUATION					
KEY RESULT AREA	PERFORMANCE INDICATORS	LIFE-OF-PROJECT TARGET	CUMULATIVE TOTAL AS OF MAR. 31, 2017	% OF TARGET REACHED	REMARKS ON % OF TARGET REACHED
	C2.2 Number of agreements, tools, and strategies promoting sustainable natural resource management and conservation that are officially proposed, adopted, or implemented as a result of RESILIM program support	26	22	85%	Part of a roll-up indicator comprising of C1.7, C2.2, C2.5, C3.4 The roll-up indicator (C1.7, C2.2, C2.5, C3.4) is: Number of agreements, tools and strategies promoting an enabling environment for resilience that are officially proposed, adopted or implemented by stakeholders as a result of RESILIM program support
	C2.3 Number of stakeholders trained in natural resources management and biodiversity conservation practices as a result of RESILIM program support	510	2,478	486%	Part of roll-up indicator C1.1, comprised of C1.5, C1.6, C2.3, C3.1, C3.2. The Science for Resilience Expowas a training event with 1,800 participants in aspects of climate change adaptation, water conservation and biodiversity conservation practices.
KRA 2.2. Ecological integrity and resiliency to climate change in key/priority conservation areas improved	C2.4 Number of hectares in areas of biological significance and/or natural resources showing improved biophysical conditions as a result of RESILIM program assistance	60,000	443, 980	740%	The target was overachieved because further consultation and follow up with land owners in 2016 and 2017 resulted in the expansion of the biosphere application as more land owners saw value in being part of a biosphere reserve and subscribed to the proposal. The application, submitted September 30, 2017, now cover an expanded area of 443,968 hectares, of which 18,199 hectares will be the core protected area covering key ecosystems.

OVERVIEW OF MONITORING AND EVALUATION					
KEY RESULT AREA	PERFORMANCE INDICATORS	LIFE-OF-PROJECT TARGET	CUMULATIVE TOTAL AS OF MAR. 31, 2017	% OF TARGET REACHED	REMARKS ON % OF TARGET REACHED
KRA 2.3. Integration of climate change adaptation and biodiversity conservation in basin water and resource management plans increased	C2.5 Number of management plans promoting integrated natural resources management officially proposed, adopted, or implemented for vulnerable hotspots as a result of RESILIM program support	5	3	60%	<p>Under the RESILIM activity supporting the application of the Marico Biosphere Reserve, landowners who signed up to be part of the reserve have to have a management plan for their land. Thus, RESILIM was expecting to count more than 30 land management plans under this indicator. RESILIM, however, resolved to count the entire biosphere application process as one.</p> <p>Two documents counted under this indicator, the LIMCOM Vision 2020 and resource mobilization strategy are only two documents, but they influence planning in various institutions across the Limpopo Basin.</p> <p>Part of a roll-up indicator comprising of C1.7, C2.2, C2.5, C3.4. The roll-up indicator (C1.7, C2.2, C2.5, C3.4) is: Number of agreements, tools and strategies promoting an enabling environment for resilience that are officially proposed, adopted or implemented by stakeholders as a result of RESILIM program support</p>
	C3.1 Number of stakeholders with increased capacity to address issues related to water and ecosystem management as a result of RESILIM program assistance	510	527	103%	Part of roll-up indicator C1.1, comprised of C1.5, C1.6, C2.3, C3.1, C3.2

OVERVIEW OF MONITORING AND EVALUATION					
KEY RESULT AREA	PERFORMANCE INDICATORS	LIFE-OF-PROJECT TARGET	CUMULATIVE TOTAL AS OF MAR. 31, 2017	% OF TARGET REACHED	REMARKS ON % OF TARGET REACHED
	C3.2 Number of government officials trained in transboundary natural resources management/climate change adaptation as a result of RESILIM program assistance	510	250	49%	Part of roll-up indicator C1.1, comprised of C1.5, C1.6, C2.3, C3.1, C3.2. What C3.2 is measuring is also partially accounted for by the other indicators (C1.5, C1.6, C2.3 and C3.1) grouped under C1.1. RESILIM underachieved in this indicator because, the original idea with C3.2 was to track government trained officials, but the number of government institutions and individuals that RESILIM engaged remained static after the 3rd Year of implementation and RESILIM achieved substantial coverage of training of our counterparts.
KRA 3.3. Knowledge and awareness of integrated and sustainable water management strategies and practices increased	C3.3 Number of people reached through awareness campaigns to promote access and use of science-based information for stakeholders as a result of RESILIM program assistance	8,500	8,006	94%	

OVERVIEW OF MONITORING AND EVALUATION					
KEY RESULT AREA	PERFORMANCE INDICATORS	LIFE-OF-PROJECT TARGET	CUMULATIVE TOTAL AS OF MAR. 31, 2017	% OF TARGET REACHED	REMARKS ON % OF TARGET REACHED
	C3.4 Number of knowledge management and communication strategies/materials for integrated and sustainable water management officially proposed or adopted to promote integration of climate change as a result of RESILIM program support	14	42	300%	<p>RESILIM very quickly realized that knowledge management and communications is an integral part of building resilience in the Limpopo Basin. It was deemed so critical that it was a pillar of the RESILIM program's consolidation phase. It was also an area of work which RESILIM's partners identified they need support. Thus, RESILIM managed to support more knowledge management and communications-related activities than initially envisioned, and as such overachieved in the number of knowledge management products and communication strategies developed and produced.</p> <p>Part of a roll-up indicator comprising of C1.7, C2.2, C2.5, C3.4</p> <p>The roll-up indicator (C1.7, C2.2, C2.5, C3.4): Number of agreements, tools and strategies promoting an enabling environment for resilience that are officially proposed, adopted or implemented by stakeholders as a result of RESILIM program support</p>

*This number was reduced from the Yr5 Quarter 2 Report in accordance with a recent internal data audit.

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