Strengthening Technical Knowledge to advance Transboundary Water Cooperation

The RAMOTSWA Project (2015 - 2019)

Introduction

Water is essential to the livelihoods, health, food security, resilience and economic development of the people living in the Limpopo River Basin. Managing water resources to balance these competing demands is a huge challenge, more so in the face of climate change and rapid population growth. Managing water resources becomes even more complicated where multiple countries depend on the same resource, in a transboundary water system. Linked to transboundary surface water resources of the Limpopo River, major shared groundwater reserves exist that can support small-scale agriculture, drought and flood resilience and urban expansion. If cooperatively managed as part of ongoing joint collaboration between states, use of groundwater can spur local economic development and strengthen resilience. However, historically, groundwater resources have been accorded less attention in water development planning processes and cooperative management of shared groundwater resources has not been widely implemented.

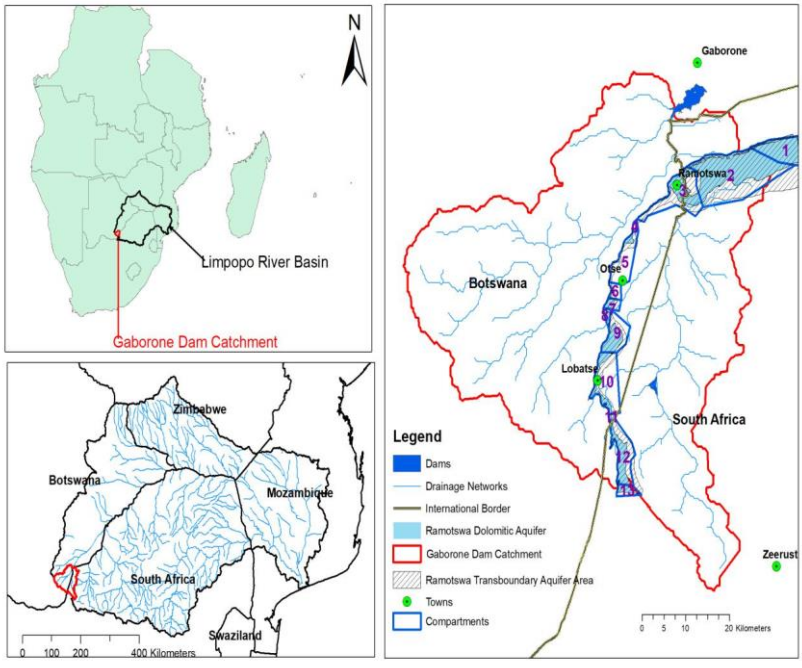
Approach

The Potential Role of the Transboundary Ramotswa Aquifer (RAMOTSWA)

The RAMOTSWA Project focuses on one of the most important shared aquifers in the Limpopo Basin – the Ramotswa Aquifer. Funded by the US Agency for International Development (USAID), the project supports equitable access to water that balances urban and rural needs with ecosystem requirements under a changing climate. It reduces climate vulnerability by promoting adaptation strategies for integrated, transboundary water resources management. Through building the capacity of transboundary River Basin Organizations, national authorities and local communities to sustainably manage natural re-sources, high priority ecosystems and human communities will be more resilient to climate induced pressure.

Objectives

The overall objective of the project is to support a shared vision and cooperation in sustainably exploiting the shared groundwater resources of the Ramotswa Transboundary Aquifer. The project facilitates joint management and better groundwater governance of the aquifer. Specifically, it aims to:



- Increase awareness of the importance and vulnerability of the transboundary Ramotswa Aquifer.
- Improve understanding of the socioeconomic importance of the aquifer area, and the challenges in water access and security across the population.
- Assess the extent and hydrogeology of the transboundary aquifer resources under present and future climate and population projections.
- Develop human and institutional capacity for shared and harmonized management and monitoring of groundwater re-sources.
- Develop tools for shared and harmonized management and monitoring of groundwater resources, aligned with the nation-al water resources management processes.
- Establish national and cross-border dialogue and cooperation on the Ramotswa Aquifer, and further encourage interna-tional cooperation on transboundary aquifers in the Southern African Development Community (SADC) region.

Key Project Components

a) Hydrogeological modelling works towards understanding of recharge and water withdrawal in the aquifer area in order to enable prediction of future impacts of changes in water use and storage

b) Managed Aquifer Recharge (MAR) potential examines potential for MAR in the aquifer area, including determination suitable locations, volumes and sources of MAR.

c) Agricultural Water Solutions seeks to strengthen agricultural water productivity in the aquifer area through the use of two technologies – Wetting Front Detector and Chameleon.

d) Ramotswa Information Management Systems (RIMS) seeks to compile, house and display mappable data from the Ramotswa Aquifer. RIMS is a GIS-based online platform that allows data visualisation for easy understanding.

e) Joint Strategic Action Plan (JSAP) is being undertaken to identify and prioritize investments and actions that can be pursued to enhance the benefits derived from the Ramotswa transboundary aquifer.

Significant progress has been made in each component. As 2019 draws closer, project activities are increasingly geared towards transitioning responsibility to partners. Efforts are being made to nest Ramotswa-based cooperation in regional frameworks such as the Botswana-South Africa Joint Permanent Technical Committee and the Limpopo Watercourse Commission. To facilitate this process, an advisory committee was established in March 2018.

Project Partners

Department of Water and Sanitation (DWS), Republic of South Africa

Department of Water Affairs (DWA) and Water Utilities Corporation (WUC), Botswana

University of Botswana (UB), Botswana

University of the Free State (UFS), South Africa

Limpopo Watercourse Commission (LIMCOM)

Joint Permanent Technical Committee (JPTC) between South Africa and Botswana

Southern African Development Community (SADC)

Local Municipalities

University of Pretoria

University of Witwatersrand

Implementers

International Water Management Institute (IWMI) - Southern Africa

International Groundwater Resources Assessment Centre (IGRAC)

Enquiries to: j.lautze@cgiar.org

Project website: http://conjunctivecooperation.iwmi.org/

USAID | SOUTHERN AFRICA
FROM THE AMERICAN PEOPLE

Environment Program Highlights

January 2016 Volume 7

USAID South Africa Low Emissions Development Program (SA-LED) launched

Left to Right:

Linda Manyuchi, Chief of Party, SA-LED program, Brian Mantlana, Chief Director, Department of Environmental Affairs, Executive Mayor of Tshwane, Councilor Kgosientso Ramokgopa, Cheryl Anderson, USAID Mission Director, Patrick G. Gaspard, US Ambassador, Henry Roman, Director, Department of Science and Technology.

Initial Green Opportunities

- Large scale solar and wind projects
- Development and maintenance manual for electric buses in Cape Town
- Energy Efficiency and Renewable Energy in Ekurhuleni
- Rooftop Photovoltaic (PV) projects in Nelson Mandela Bay
- Waste-Energy project in Sedibeng District Municipality

In this Issue:

South Africa has embarked on an ambitious effort to use Low Emissions Development (LED) as a means to reduce its substantial greenhouse gas emissions (GHG) levels in a sustainable and equitable way. This will require transformational change at multiple levels and sectors that includes overcoming key capacity bottlenecks and coordinating with a diverse set of actors.

The USAID South Africa Low Emissions Development (SA-LED) program was developed in collaboration with the Government of South Africa (GoSA) to implement goals embodied within the National Climate Change Response White Paper. South Africa has a rapidly growing economy that is highly dependent on fossil fuels. As the economic status of individuals improves, the demand on already strained energy production and associated greenhouse gas emissions is expected to increase dramatically. The partnership aims to move the country towards achievement of the ambitious emissions reduction targets it announced in the National Climate Change Response White Paper. Key opportunities lie in the area of waste management, transportation, renewable energy and energy efficiency.

The program was officially launched on November 10, 2015 by His Excellency Patrick G. Gaspard, Ambassador of the United States of America. The event was attended by dignitaries from the Government of South Africa including the Mayor of Tshwane and directors from the departments of Environmental Affairs and Science and Technology, the private sector and a wide range of Non-Governmental Organizations.

Implemented in partnership with the Department of Environmental Affairs (DEA) and Department of Science and Technology (DST), the $15 million program will run for five years. The program is working with local government to build capacity and develop projects that respond to climate change and support South Africa in transitioning to a green economy.

The program will help to bridge the gap between public institutions and investors, and will also help catalyse innovative low emissions development projects in municipalities across the country. South Africa is committed to taking action to reduce its greenhouse gas (GHG) emissions by 34% by 2020 and 42% by 2025.

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FROM THE AMERICAN PEOPLE

Environment Program Highlights

Using Mobile Technology to Combat Poaching in Botswana

USAID Southern Africa has been supporting communities in the Okavango Basin to address development challenges across multiple sectors for more than ten years. Through the Southern Africa Regional Environment Program (SAREP), USAID has worked to address threats to biodiversity conservation, water supply, sanitation and hygiene, climate change adaptation and illicit wildlife crime.

Illicit wildlife crime is a complex development problem that does not recognize geo-political borders. Combating the illegal wildlife trade requires a highly adaptable, holistic approach that combines stronger engagement with communities and law enforcement, promoting crime prevention and improved wildlife management.

Recently, SAREP entered into an agreement with Human Network International (HNI) to develop a mobile phone service for the Botswana public which will allow the public to provide anonymous information to the Botswana authorities regarding illicit wildlife trade. The service will also connect to the "3-2-1" mobile information service which provides access to clear advice on activities from, how to undertake conservation agriculture, to what steps to take to reduce exposure to HIV or malaria. Use of anonymous, mobile technology will help address one of the many challenges in combating poaching and wildlife trafficking, the fear of reprisal by the public for identifying poachers and traffickers.

While increasing rates of rhino and elephant poaching for illicit wildlife trade has not affected Botswana as much as it has other countries in the region, there has been a dramatic increase in poaching related to illegal bush-meat trade within Botswana. This increase began after Botswana enacted a new law banning all hunting, which eliminated one of the avenues for communities to raise funds.

The ability for a private citizen to anonymously provide information related to a poaching incident could greatly improve the Government of Botswana's ability to combat a growing illegal bush-meat trade.

USAID and SAREP are working closely with the Ministries of Health, Environment and Agriculture in Botswana to ensure that the information provided by the "3-2-1" service is accurate and in a format easily accessed and understood by the public. Similar platforms and services have been provided by HNI in Uganda, Tanzania, Zambia, Madagascar, Malawi and Mozambique as well as countries in West Africa. The mobile phone service provider Orange Botswana has officially expressed interest in partnering with USAID on this initiative.

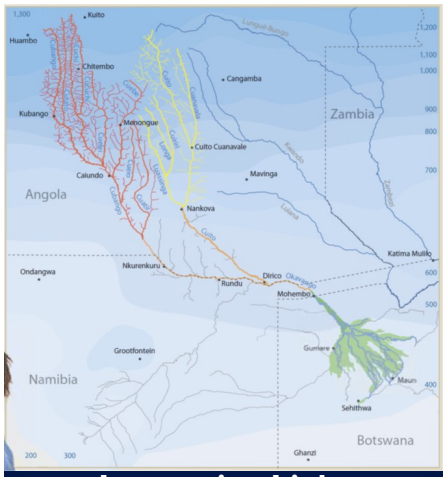
Protecting the Okavango System

When we think about the Okavango Delta, we often think about herds of elephants, hippos, lechwe and crocodiles, rafts of reeds, fields of papyrus, and huge flocks of colorful birds. However, what matters most is the water.

The Okavango Delta is the largest wetland and largest Ramsar site in Southern Africa, covering over five and a half million hectares. The Delta supports an estimated 122 species of mammal, 444 species of bird, 64 species of reptile, 33 species of amphibian and 71 species of fish, including endangered, threatened and vulnerable species such as the wild dog, black rhino, and African elephants. USAID, through the Southern Africa Regional Environment Program (SAREP) supported the application by Botswana to have the Okavango Delta declared the 1000th UNESCO World Heritage Site. Through SAREP, USAID is currently providing support to the creation of two National Parks in South East Angola to protect the upper basin, which provides 95% of the water in the Okavango system.

The lifeblood of the Okavango comes from the Cuando and Cubango rivers, which begin their course in the highlands of S.E. Angola, and flow very slowly south and east into the Zambezi region of Namibia (formerly the Caprivi Strip), then into Botswana. Annually, 11 cubic kilometers (that is 11,000,000,000,000 liters) flow into the Okavango Delta. Due to the very gradual elevation drop, the water that falls in Angola can take three months to flow the 800 kilometers to the Delta, and another four months to flow through the 240 kilometer maze of channels that comprise the Delta.

USAID is working with the Government of Angola to develop management plans for the two new parks. Developing management plans and enhancing the capacity of the park managers will increase the protection for over 6.4 million hectares of critical Okavango Basin upland, an area twice the size of Maryland in the United States.



Interesting Links

https://resilim.exposure.co/resilient-mangroves-resilient-communities

A Light Conversation with IWMI's Karen Villhoth

Vibrant, passionate and clearly dedicated to her work, Karen Villhoth works with the International Water Management Institute (IWMI) as Principle Researcher-Groundwater Management.

Following a USAID grant to IWMI in August 2015 to implement a transboundary water resource project, Karen took up an additional role as project manager for the USAID Ramotswa Aquifer project. The initiative aims to develop a scientifically informed, integrated and participatory approach to the transboundary management of the Ramotswa aquifer, improving both our biophysical as well as our socio-economic understanding of the groundwater system.

The point however of the "Spotlight Corner", is to get to know the other, inner personality. This is what we may not have known about Karen:

What do you wish other people knew about you as a person?

"That I live what I preach. I try to have as small an ecological footprint as possible. Almost all my clothes are second-hand, and have lived vegetarian for 20 years".

What might someone be surprised to know about you?

"That I have been a single mother for many years, raising my kids on my own in an international atmosphere while building my career in research for development. I have been a devoted acrobat for many years".

What is a typical interesting work day for you?

"A day full of challenges where my think-tank and networking abilities come together in new and interesting constellations of committed and competent people who are dedicated to solve tough problems related to groundwater".

What would you say are some of your strongest beliefs about the work you do? And why?

"That you can make a difference in the way people think and that you can contribute toward more accountability and responsible behavior through awareness raising, knowledge generation and sharing".

What do you find most challenging about your work? And why?

"Demonstrating the necessary diplomacy while convincing people to join team and trust building efforts that will eventually result in partnerships and solutions that are 'out of the box', but breaks the habitual ways of thinking".

Karen is not a typical groundwater scientist. She strives to break boundaries in her analysis of problems by looking at groundwater in food production, poverty alleviation etc. The most rewarding part of her work is the opportunity to see people from different backgrounds, roles and disciplines start talking about common problems, joining forces and spearheading the change needed toward better solutions that benefit more people.

Fighting Alien Invasive Species; Improving Livelihoods

In partnership with the International Union for Conservation of Nature (IUCN) and the Desert Research Foundation of Namibia (DRFN), USAID Southern Africa is working with communities in the Gibeon area of Namibia to clear Prosopis, an invasive alien tree species commonly found along the banks of the Fish River.

Prosopis species are highly invasive and have detrimental effects on biodiversity, ecosystem services and livelihoods. Each Prosopis tree has a potential of consuming up to 50 litres of water per day, presenting major challenges in water scarce Namibia. The pilot project has taken a win-win approach to the invasive species by exploiting its economic benefits while reducing impacts to biodiversity and water resources through clearing. The project has built the capacity of over 30 previously unemployed community members in plant identification and processing for firewood and other livestock and domestic uses.

In December 2015, Namibia's Deputy Minister of Gender Equality and Child Welfare, Honorable Lucia Witbooi launched the Prosopis Clean-Up Campaign in Gibeon. Over 100 volunteers attended the launch.

Building Capacity → ***Clearing Alien Invasive Species*** → ***Creating Alternative Livelihoods***

The U.S. Agency for International Development provides economic, development and humanitarian assistance worldwide. USAID supports people's efforts to develop themselves and their countries. In Southern Africa, the United States seeks to increase trade and strengthen economic ties within the region, address the HIV/AIDS crisis, mitigate recurrent food insecurity, and strengthen democracy to reduce the risk of conflict in the region. USAID/Southern Africa, located in Pretoria, South Africa, complements and enhances USAID's bilateral programs in the region, supporting unique and innovative regional activities and providing a range of services to assist USAID missions in the region.

USAID/SA, P.O. Box 43, Pretoria, 0027. Tel: 27 (012) 452 2000, Fax: 27 (012) 460 3177

For more information about USAID/Southern Africa Environmental projects, please go to: http://www.usaid.gov/southern-africa-regional

SHOTHA WEEKLY

DEPARTMENT OF WATER & SANITATION **Weekly Newsletter** 07 August 2015

HIGHLIGHTS

INTERNATIONAL ISSUES
GROUNDWATER DISCUSSIONS

INFO SHARING ON POLICIES
BBL SESSION ON MISCONDUCT

SERVICES FOR DWS STAFF
NEW WELLNESS PSP

CAMPAIGN/EVENT

NATIONAL WOMEN'S DAY: 09 AUGUST 2015

DID YOU KNOW?

Prior to 1994, women's representation in the South African Parliament was a mere 2,7%. Following the first democratic elections it stood at 27,7%, and after the 2009 national elections it reached 42%.

QUOTE OF THE WEEK

"You cannot open a book without learning something."

– K'ung fu-tzu (Chinese teacher, editor, politician and philosopher of the Spring and Autumn period of Chinese history).

COUNTRIES UNITE ON GROUNDWATER PROTECTION

Attendees of the Groundwater discussions meeting among SA, Namibia and Botswana which was held recently at Birchwood Hotel

South Africa, Namibia and Botswana through their respective water champion representatives had a deliberation on groundwater protection at Birchwood Hotel, from 28-31 July 2015.

The meeting was coordinated by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). These three countries have ground water belts running across their international borders. One of the objectives of the engagement was to create awareness on trans-boundary aquifers.

Since small rural communities in the aquifer belts depend highly on groundwater, it was agreed that such water sources should be protected and rehabilitated. The countries also looked closely at water diplomacy. It was agreed, based on evidence of lessons learned from other trans-boundary aquifers in Africa that these water sources may also be a basis of conflict.

The focus was on two projects named Stampriet Trans-boundary Aquifer System (STAS) and Ramotswa Trans-boundary Aquifer Project (RAMOTSWA). The STAS stretches from Central Namibia into Western Botswana and South Africa's Northern Cape Province, and lies within the Orange River Basin. RAMOTSWA on the other hand lies in the Limpopo River Basin and is already water stressed as the Gaborone Dam is almost empty.

The challenges faced by both trans-boundary aquifer projects are almost similar. The STAS has lost 60% of clean potable water due to leaking boreholes and illegal water abstractions. Another challenge is the alien invasive species called Prosopis, which takes large quantities of groundwater and limits the grazing space for local farmers.

In the RAMOTSWA project, the area of its operation is severely water stressed. There is even a proposal to consider re-using wastewater for irrigation. Parts of this trans-boundary aquifer have experienced groundwater pollution. This pollution is mainly of organic nitrates which are suspected to be from pit latrines near the water table. Another source of pollution at RAMOTSWA is wastewater.

Challenges identified in RAMOTSWA include the climate change and lack of groundwater management at municipal level. Many of its boreholes are running dry due to mismanagement.

With regard to the STAS, it was recommended that there be development and implementation of policies and legislation to guide control measures for Prosopis and other alien invasive species.

It was recommended that there should be knowledge sharing and transfer of ownership to the communities of all installed facilities once these projects are running fully. This will make responsibilities and willingness to assist when natural disasters strike not to lie with the government only but everyone concerned.

Zwakele Thabede

GROUNDWATER

Agreement sought on transboundary aquifers in the SADC

South Africa, Botswana and Namibia have been urged to sign an agreement on how their shared groundwater resources are developed and sustained. This is according to Geert-Jan Nijsten, senior researcher at the International Groundwater Resources Assessment Centre in the Netherlands.

He spoke to *Farmer's Weekly* on the sidelines of a gathering dubbed a 'regional meeting on tools for the sustainable management of transboundary aquifers'. Representatives from the International Water Management Institute, Unesco, the Swiss Agency for Development and Cooperation, and the Consultative Group for International Agricultural Research's Program on Water, Land and Ecosystems, among others, attended the meeting, which took place in Boksburg, Gauteng, recently. Government representatives from the three countries also attended.

There were two case studies on the transboundary aquifers: Ramotswa Aquifer in the Limpopo Basin, and the Stampriet Aquifer, which bordered South Africa, Botswana and Namibia, Nijsten said.

"The aim is to get the three countries working together in managing the groundwater resources in future in a sustainable way," he said.

There were more than 600 aquifers in the world, but only five had internationally-recognised agreements, according to him.

Tales Carvalho Resende, water and environmental expert at Unesco, told *Farmer's Weekly* that South Africa, Botswana and Namibia were "cautious" about reaching an agreement on the shared groundwater resources.

"We have to show them that water has an impact on policy. That is why we brought together all the experts in environmental, groundwater and legal matters," he said.

David Gadd, programme manager for the Resilience in the Limpopo River Basin programme, said the project would facilitate joint management and better groundwater governance focused on scientific knowledge, social redress and environmental sustainability. This would reduce poverty and increase prosperity, livelihoods and food security in the face of climate change and variability. – *Luyolo Mkentane*

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FROM THE AMERICAN PEOPLE

Environment Program Highlights

October 2015 Volume 6

Support for Proclamation of Marico Area as a UNESCO Biosphere Reserve

Left: The eye of the Marico River **Right: The Tufa Waterfall in the Marico Area of South Africa**

In this Issue:

The Marico catchment area surrounds the town of Groot Marico in South Africa and constitutes a magnificent bushveld area of koppies, cliffs, ancient indigenous trees and bush. It is home to naturally occurring game, birds and aquatic creatures.

The Marico River is the lifeblood of the Marico Catchment and is one of South Africa's remaining few largely unmodified free flowing rivers, and an important source of water for the Limpopo River. The Limpopo River provides water for various commercial and domestic uses and plays an important role in the economy of the Southern Africa region.

Through the Resilience in the Limpopo River Basin program (RESILIM), USAID is proud to associate and collaborate with the Marico River Conservation Association (MRCA) and its vision for a legally established, UNESCO recognized Marico River Biosphere with a goal to protect and conserve this unique ecological capital. USAID shares MRCA's vision for at least 60,000 hectares of land to be proclaimed as a UNESCO Biosphere Reserve.

In August 2015, the MRCA handed over an application to the North West Parks Board on behalf of 35 landowners for a proposed 18 100 hectares protected area in the Marico Catchment. The MRCA is working in partnership with RESILIM in building the resilience of both ecosystems and communities, and in the protection of water resources at catchment level.

USAID looks forward to a successful outcome of the application for both the Biodiversity Stewardship program as well as for the declaration of at least 60,000 hectares of land as a UNESCO Biosphere Reserve.

Earlier in the year, RESILIM partnered with the MRCA to mitigate the threat that wildfires pose to biodiversity and livelihoods through the training of 68 members of the local community in South African Qualification Authority (SAQA) accredited courses, *Suppressing Wildfires* and *Basic Safety in Combating Wild Fires.* Prior to the training, farmers used to gather untrained volunteers to fight the fires.

Africa is often called "the continent of fire," and fire is a critical part of Southern African ecosystems. Inappropriate fire management techniques however threaten biodiversity and the flora and fauna that depend on fire to survive. At the same time, fire endangers human infrastructure and lives.

USAID | SOUTHERN AFRICA

FROM THE AMERICAN PEOPLE

Environment Program Highlights

Integrating Democratic Governance and Natural Resource Management

Africa is rich in natural resources, including: precious minerals, agricultural land, water, fisheries and forests. Yet, Africa continues to suffer from incidences of extreme poverty, deepening inequality and underdevelopment.

Recognizing that a thriving extractives industries sector can contribute to economic development, alleviation of poverty and an improved standard and quality of life throughout the region, USAID also recognizes the need for a strong human rights approach to natural resource governance that is transparent and holds governments accountable.

USAID Southern Africa's Democracy, Human Right and Governance (DRG) team is providing support to the Legal Resources Center (LRC) in South Africa to increase awareness and engagement of communities' customary rights to natural resources on a regional level including legal practitioners, government officials and social movements through the African Commission on Human and People's Rights (ACHPR). This includes the development of African jurisprudence on customary law as a source of law and increasing the understanding of local communities' rights to natural resources. Complementing this work, from March 9-13, 2015, the Southern Africa Development Community (SADC) Lawyer's Association (SADC LA) hosted training in Johannesburg, South Africa for twenty five lawyers from across the SADC region on natural resource governance. As a result, lawyers who participated in the workshop continue to report multiple contributions to natural resource governance in their home countries.

Managing Groundwater Across Borders

Water is essential for biodiversity conservation, resilience of ecosystems, economic development, population health, welfare and security in Southern Africa. Managing water resources to balance these demands is challenging enough, but when you add growing populations, increasing impacts of climate change and the international politics when the water system crosses international borders you often end up with inaction.

USAID Southern Africa has focused on these transboundary water resources for several years in the Okavango, Limpopo and Orange/Senqu river basins. Collectively these basins include Angola, Botswana, Lesotho, Mozambique, Namibia, South Africa and Zimbabwe, all members of the Southern Africa Development Community (SADC). As a result of years of investment by USAID, the Southern Africa Environment Team was approached to lead the development of one of the first transboundary aquifer management projects in Southern Africa.

According to the International Water Management Institute (IWMI), there are 592 transboundary aquifers identified worldwide, 70 of which are in Africa, but only 5 aquifers have legal management arrangements between the countries that share the resource, and none of these are in the SADC region.

The lack of a shared management agreement, however, hasn't slowed the withdrawal and use of groundwater for agriculture, industry and personal use.

The Ramotswa aquifer is one of the most important shared aquifers in the Limpopo River Basin - it bisects the border of South Africa and Botswana, including Gaborone, the capital of Botswana and home to over one million people.

To address the challenges inherent in managing an aquifer, about which very little is known, USAID/Southern Africa and the Global Development Lab, along with the USAID funded Resilience in the Limpopo River (RESILIM) project, IWMI, the University of the Witwatersrand, U.S. Geological Survey, and partners from the governments of South Africa and Botswana have come together to develop a program to map the Ramotswa aquifer, develop a shared management plan, build the capacity of resource managers on both sides of the border, and develop low-water agriculture solutions.

The three-year Ramotswa project will advance the science of groundwater management in Southern Africa through a Partnership for Enhanced Engagement in Research (PEER) project with the USGS and Wits University, and the placement of a Research and Innovation Fellow from one of the Lab's partnering U.S. universities. This PEER award will be funded by the South Africa Department of Science and Technology and the Lab, making it the first ever PEER award to be co-funded by a host government.

Interesting Links

Publications from Seychelles Coral Reef Project:

http://www.tandfonline.com/doi/abs/10.2989/1814232X.2015.1078259

https://peerj.com/articles/1287/

In the Spotlight: Nature Seychelles' Sarah Frias-Torres

Originally from Spain and the USA, Dr. Sarah Frias-Torres was hired as Chief Scientist and Project Coordinator for the USAID funded "Reef Rescuers-Restoring Reefs in the Face of Climate Change" project implemented by Natures Seychelles. In collaboration with an international team of marine biologists and scientific divers, Sarah is working to bring back to life the degraded coral reefs of the Seychelles. With over 25,000 corals and 34 different species transplanted in an area covering over half a hectare in the Praslin Islands of the Seychelles, seeing the transplanted corals grow healthy and attracting more and more fish each day is most refreshing and rewarding aspect of the job for Sarah.

Sarah is a problem-oriented scientist. For every problem she finds she says "I search for a solution using the scientific process. In this way I'm not the stereotype marine biologist investigating obscure phenomena. I want to understand how the ocean works, how marine life works, and with that knowledge, fix the problems we have today in the conservation and sustainable management of the oceans". This however is not always easy. The combination of fieldwork at sea near the equator coupled with the limited resources of a Small Island Developing State (SIDS) makes her work "the poster child for Murphy's Law". In other words, anything that can go wrong will go wrong. With some humor she says "Sometimes the seas are too rough to dive in, the rain too strong so we risk losing the divers at sea upon recovery. Or the boat engine doesn't start. The buoys marking our dive and mooring sites disappear (it seems the fishermen like them too much)". Yet, these are the very challenges that magnify every achievement she says.

Sarah strongly believes in restoration. She believes in helping nature restore and heal itself. Her work with the project has demonstrated that large scale coral reef restoration is feasible, cost effective and yields results. Sarah is proud to see the results of the work already and hopes her experience will help people around the world to set their own coral reef restoration projects without having to reinvent the wheel. When not analyzing data in a lab or deep in the sea with the corals, Sarah is out observing animal behavior. This is her hobby. She believes that mankind has much to learn from animal behavior. In her spare time, Sarah also likes to draw, paint and write fables about marine life. In her Ocean Bestiary stories, she usually talks from the point of view of the animal. This is clearly an interesting way to translate scientific jargon into layman's language and reach more diverse audiences. She cannot think of a better farewell gift to the Seychelles than to leave behind a restored coral reef. See her remarkable Ocean Bestiary stories at https://oceanbestiary.wordpress.com/

Successful Partnerships in Science Diplomacy

USAID Southern Africa and the South Africa Department of Science and Technology (DST) are creating new partnerships to foster scientific collaboration between the two countries.

In 2010 USAID Washington launched the Partnership for Enhanced Engagement in Research (PEER) program to fund research in nearly every country USAID works. Each year since, USAID released a call for proposals and then worked with the U.S. National Academies of Science and USAID missions to select proposals for funding.

To receive a PEER grant, researchers in the developing world had to develop a proposal that addressed an area of significant development need and partner with a U.S. researcher with an active grant from the National Science Foundation (NSF). USAID then provided the international researcher with funds to support their research. In 2014 USAID Southern Africa and the South Africa DST changed this approach for South African researchers. Beginning in 2014, during the fourth annual PEER call for proposals, DST helped to set the priorities for research in South Africa, and worked with the Mission to review and prioritize research proposals. DST also became an equal partner in funding selected projects. This agreement made South Africa the first country to partner with USAID to fund PEER research projects.

Through the DST-USAID partnership, two proposals were selected: 1) Professor Michael Aliber from the University of Fort Hare will be partnering with Professor Stephen Ventura from the University of Wisconsin, Madison to identify opportunities to increase food security in the Eastern Cape, and 2) Professor Tamiru Abiye, from the University of the Witwatersrand is partnering with Richard Healy from the U.S. Geological Survey to map the Ramotswa aquifer, which extends from just north of Gaborone, Botswana into the North West Province of South Africa.

Due to the success of the 2014 partnership, USAID Southern Africa and DST have agreed to expand this partnership in 2015. This year the focus for research will be on Water Supply, Sanitation and Hygiene, and Low Emissions Development. To highlight the importance of the partnership between USAID and the Government of South Africa, DST has asked to sign a Memorandum of Understanding with USAID on Science and Technology.

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Botswana Guardian
February 19, 2016
www.botswanaguardian.co.bw

USAID involved in Ramotswa Transboundary Aquifer

The International Water Management Institute for Southern Africa in collaboration with the United States Agency for International Development (USAID) are involved in the Ramotswa Transboundary Aquifer which is a groundwater resource shared between Botswana and South Africa.

The project supports a long-term joint vision and cooperation on the shared groundwater of the Limpopo Basin, and also facilitates joint management and better groundwater governance, focused on coordination, scientific knowledge and social redress and environmental sustainability.

The project will also contribute to the reduction of poverty and inequalities and increase prosperity, livelihoods and food security in the face of climate change and variability.

It will also enhance the understanding of the overall water storage and water security in the region, particularly using the Ramotswa aquifer.

> This means they will have helicopters flying around the Ramotswa area gathering current data on the Aquifer

Starting from the 18 February 2016, Scientists from the International Water Management Institute in collaboration with the team from the Exploration Resources International (XRI) from the United States will be mapping the Ramotswa Transboundary Aquifer using the Airborne Electromagnetic technology.

This means they will have helicopters flying around the Ramotswa area gathering current data on the Aquifer.