

# THE *Well*

◆ SADC GROUNDWATER NEWSLETTER ◆

SEPTEMBER 2018  
EDITION 1, VOLUME 1



3

THE FIRST ANNUAL GROUNDWATER  
CONFERENCE TO TAKE PLACE THIS  
SEPTEMBER



6

GROUNDWATER SAVES DROUGHT-  
STRICKEN CAPE TOWN



9

SADC-GMI TO TACKLE POOR DATA  
SYSTEMS

Saturday 22/09/2018  
Time: 16:39



  
GROUNDWATER MANAGEMENT INSTITUTE

# EXECUTIVE DIRECTOR'S NOTE



The month of September has a special meaning to us. This month we celebrate the second year of our full operationalisation as SADC's Centre of Excellence for sustainable and equitable groundwater management in the region. Two years is ordinarily a short period, certainly not enough to give full expression to the real substance of a key regional institution. As such this inaugural newsletter marks a new beginning for us. It is also an opportunity to welcome all stakeholders to our inaugural conference under the theme "Adapting to Climate Change in the SADC Region through Water Security – A Focus on Groundwater". This will be the confluence where all groundwater stakeholders share experiences and chart a progressive and inclusive path for the future. The task of giving life to SADC's Regional Strategic Action Plan on Integrated Water Resources Development and Management Phase IV, SADC's strategic framework from 2016-2021, has meant that the past two years have been eventful. A lot has gone into the formidable task of giving

Member States the institutional muscle necessary to develop groundwater and to measure its equitable impact on socioeconomic development. SADC-GMI's intervention has brought the necessary urgency to multi-state cooperation on transboundary groundwater basins. This has certainly lifted the burden previously involved in integrating knowledge, skills

*“A lot has gone into the formidable task of giving Member States the institutional muscle necessary to develop groundwater.”*

*- James Sauramba, Executive Director, SADC-GMI*

and capacity across the region. The SADC Subcommittee on Hydrology now finds a more conducive environment for implementing infrastructure funded initiatives with stakeholders through the sub-grant Scheme which is carried out by National Focal Groups at Member State level. National Focal Groups avail two important opportunities worth mentioning. First, they offer us a coordinated approach to capacity building

at Member State level. For all SADC countries we now have a fuller appreciation of the needs involved, the stakeholders affected and the nature of the support we can provide. Second, they show funders that the blending of data, research, good governance and strong institutional capacity make for sustainable infrastructure projects worth investing in. We hold our inaugural conference fully aware of the fragility that climate change brings to groundwater resources. This is cause for serious concern. But this also presents interesting challenges for groundwater stakeholders across the region. These challenges should embolden us to find creative and lasting solutions to water security in the region. This is a precious moment for us to ponder more fruitfully about the exciting future ahead for groundwater. Let it not be a missed opportunity.

Mr James Sauramba

## Groundwater Conference

World's Top Water Experts to Meet in Johannesburg for Inaugural Conference



THE FIRST SADC Groundwater Conference will draw experts from across southern Africa as well as international organizations

The SADC region will hold its first ever conference focusing on groundwater and its role in insulating the region against the dangers of climate change. The gathering, hosted by the SADC Groundwater Management Institute (SADC-GMI), is expected to draw international groundwater experts and stakeholders. They will meet from September 26-28, 2018 at the Birchwood Hotel and OR Tambo Conference Centre in Johannesburg, South Africa. SADC-GMI's executive director James Sauramba said climate change has had a visible impact on water resources in the region. According to Sauramba, the conference theme "Adapting to Climate Change in the SADC Region through Water Security – A Focus on Groundwater" is a direct response to growing dependency on groundwater.

"As we have progressed, climate change has taken a huge toll on our water resources and water security is diminishing

*“With more focus on conjunctive use of ground and surface water, it will be much quicker and easier to reach Sustainable Development Goal 6.”*

*- Phera Ramoeli, head of SADC Water Division; SADC Secretariat Infrastructure and Services Directorate*

significantly," Sauramba said. The region was recently hit by a severe El Niño induced drought affecting more than 39 million people towards the end of 2016. SADC-GMI hosts the conference in collaboration with the Government of South Africa, the United Nations Educational, Scientific and Cultural Organization (UNESCO-IHP), the International Groundwater

Resources Assessment Centre (IGRAC), the International Water Management Institute (IWMI), Global Water Partnership for Southern Africa (GWPSA) and the Groundwater Solution Initiative for Policy and Practice (GRIPP). The conference marks two years since SADC-GMI's launch in September 2016 as a Centre of Excellence on groundwater. Since then the institute has filled the role of promoting equitable and sustainable use of ground and surface water resources shared by the 16 SADC Member States. According to Sauramba no regional institution existed with this specific purpose before that. "There has been no institutional structure which existed in perpetuity like a going concern that looks at groundwater.

Continues on page 4



## Co-operation and Sustainability Crucial for Groundwater Management

Strong partnerships among stakeholders involved in managing SADC's shared transboundary water resources increase the benefits for groundwater users in the region. SADC-GMI worked with the Pegasys Institute to develop a long term financial sustainability plan. SADC-GMI Executive Director James Sauramba said this was critical for the future of the organisation. "Firstly we did a strategic business plan which also has one of its strategic objectives as financial sustainability. We came up with this plan for the period 2018 to 2023. This plan looks at our five income streams and how they will take us through these five years," Sauramba explained. Dr Barbara Schreiner from the Pegasys Institute said groundwater stakeholders should be purpose driven to ensure sustainability in the long run. "A critical element of the approach must be ensuring that groundwater is managed in such a way that it contributes optimally to national development objectives – water management is not an end in itself," Dr Schreiner said. Capacity implementation in groundwater management is what makes the policy planning, strategies and other grand visions come to life. "SADC-GMI is an extremely important player in the management of groundwater in terms of building our knowledge base and capacity in the region," Dr Schreiner added. 💧

Continues from page 3

## Groundwater Conference

It has always been that one project comes in and when it is done everyone disperses," Sauramba explained. SADC-GMI, as a subsidiary institution of the SADC Secretariat, gets its mandate from Programme 6 of the Regional Strategic Action Plan on Integrated Water Resources Development and Management IV. The programme aims to "enhance sustainable development through people-centred adaptive management of water resources". Phera Ramoeli, who heads the Water Division of the SADC Secretariat's

*“I think it will help trigger some dialogue between countries for identifying opportunities to collaborate.”*

- Dr Jonathan Lautze, Senior Researcher, IWMI

Infrastructure and Services Directorate, said the growing attention on integrated use of groundwater and surface water can help the region achieve goal 6 of the Sustainable Development Goals (SDGs) faster. "While there has not been any systematic process of measuring the impact scientifically, with more focus on groundwater-surface water conjunctive use, it will be much quicker and easier to reach SDG 6 as more water will be made available," Ramoeli said. SDG 6 calls on countries to "ensure availability and sustainable management of water and sanitation for all" by 2030. SDG 6.5 makes specific reference to integrated water resources management and transboundary cooperation. Ramoeli also chairs the SADC-

GMI Board. He said setting up the institution from scratch has offered many lessons. "There are number of regional subsidiary organisations in SADC from which SADC-GMI can learn from, they in turn can learn from SADC-GMI. These include the Southern African Centre for Renewable Energy and Energy Efficiency which has also just been established based in Namibia," Ramoeli added. The link between water, energy and food is a subject on several papers to be presented at the conference. Keynote speakers leading these discussions will include Karen G. Villholth (IWMI), Prof Jason Gurdak (UNESCO – IHP), Roger Parsons (Parsons & Associates), Dhesigen Naidoo (Water Research Commission, South Africa), Callist Tindimugaya (International Association of Hydrologists) and Gavin Kode (Western Cape Government, South Africa). Dr Jonathan Lautze from IWMI, who will co-present a paper on "Assessing the conjunctive management of surface and groundwater in transboundary waters: What lessons for SADC", said this is an important opportunity for all stakeholders to share knowledge, tools and experiences. "I think it will help trigger some dialogue between countries for identifying opportunities to collaborate. We can learn from each other and improve what we are doing," Dr Lautze said. He hopes that the conference can also help identify additional aquifers that could be a good basis for collaboration and cooperation. 💧

## Data Sharing and Innovation Bring Stakeholders Together

Developing smart and effective tools for managing water resources between different countries is an important and delicate process. International Water Management Institute (IWMI) senior researcher Dr Jonathan Lautze said improving or implementing transboundary aquifer management innovations includes a lot of unknowns. He said the technical side of groundwater management can be complex. "A lot of effort goes into the technical management of groundwater. It is always a



REPRESENTATIVES FROM SADC-GMI, UNESCO-IHP and IWMI want to extend good practices taken from Stampriet and Ramotswa to other SADC transboundary aquifer projects. (SADC-GMI)

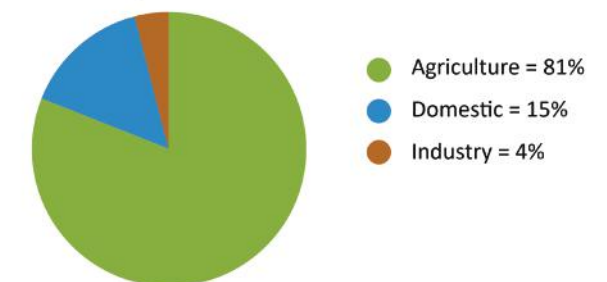
*“There is a lot to understand in the flow dynamics in transboundary aquifers.”*

- Dr Jonathan Lautze, Senior Researcher, International Water Management Institute

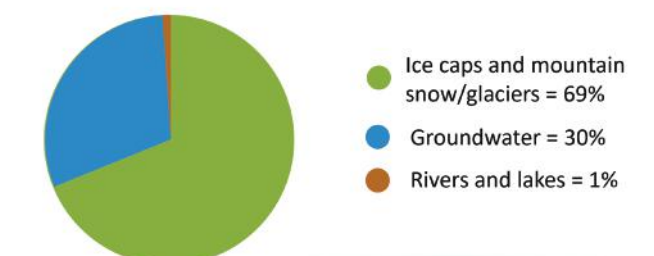
struggle because people want to know things in a hurry, while gathering scientific based knowledge is time consuming. There is a lot to understand in the flow dynamics in transboundary aquifers and the hydrogeology involved," Dr Lautze said. Over 6 -7 March 2018 a regional meeting was convened featuring SADC -GMI, IWMI and UNESCO-IHP. The meeting discussed the importance of shared groundwater resources and the best approaches and cooperative practices necessary to enhance the sustainable management, protection, access and conjunctive of the resource within the region. Sharing experiences and innovations was the main focus. The meeting put three ongoing regional groundwater projects under the spotlight. These project were the Sustainable

Groundwater Management Project in SADC Member States implemented by SADC-GMI; Governance of Groundwater Resources in Transboundary Aquifers implemented by UNESCO-IHP and Resilience in the Limpopo Basin implemented by the International Water Management Institute. According to Dr Lautze sharing tools among Member States requires stakeholders to form a community of good practice since there are differences between some countries. 💧

### 1. Water use by sector in SADC



### 2. The World's Fresh Water



1. Data: Groundwater Management in the Southern African Development Community, sadc-gmi.org  
2. Data: www.un-igrac.org



# Groundwater Saves Drought-stricken Cape Town



THE MOLTENO RESERVOIR is fed by water from the natural springs in the Oranjezicht Main Springs Chamber.

In 2015, during the severe drought which afflicted the Western Cape of South Africa, the City of Cape Town came close to being the first major city on earth to run out of water. Predictions in early 2018 were that by April the dams would have reached critical levels. Plans were put in place for Day Zero, the day when the city's water would run out. As the regional government, communities and business owners struggled to prepare for

Day Zero and find alternative sources of water, Cape Town's aquifers emerged as the saviour that kept taps flowing until the drought lessened and rain returned.

“Groundwater is less sensitive to climate variability.”

- Dr Beason Mwaka, Director of Water Resources Planning Systems; Department of Water and Sanitation, South Africa

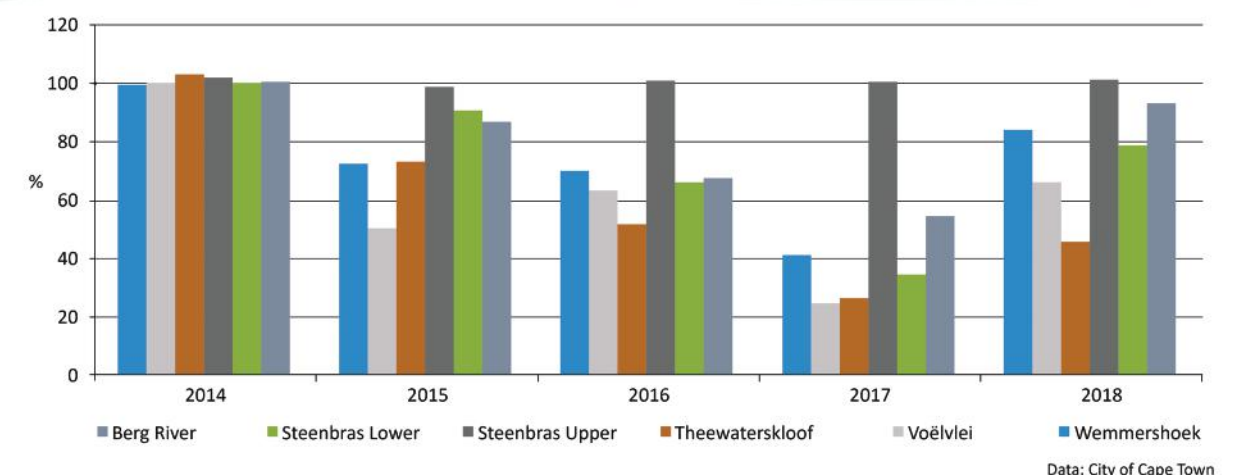
Dr Beason Mwaka, director of Water Resources Planning

Systems at South Africa's Department of Water and Sanitation, said this was possible because groundwater adds stability to climate change mitigation. “Groundwater is less sensitive to climate variability. It is a more stable component although it may not have much water or refill quickly,” Dr Mwaka said. At the height of the drought, the City of Cape Town required 500 million litres of water per day, the remaining resources

were steadily dropping below that. But by tapping into three large aquifers, the city was able to supplement this flow with 80 million litres per day from the Cape Flats aquifer, and 30 and 40 from the Atlantis and Table Mountain aquifers respectively. In addition to official tapping into the aquifers, there was a steep increase in the number of private boreholes drilled. At the time the World Wildlife Fund released a statement saying “Groundwater is a hidden resource that is a national asset and belongs to all South Africans. “As Cape Town already has 22 000 registered boreholes, it's a privately accessed resource and, by default, under the influence and ‘management’ of thousands of users.” said Dr Mwaka. The push to use groundwater was driven by the City of Cape Town Metropolitan Municipality. The city undertook numerous

marketing campaigns to better equip the public and businesses on efficient water use and how to access groundwater. Dr Mwaka said conjunctive use of water resources contributes to climate resilience. “We are now encouraging the conjunctive use of groundwater and surface water in order to be climate resilient, and not only use run-off from rivers and dams,” Dr Mwaka urged. The drought was a rare and severe occurrence but climate change could increase the chances of another one. Temperatures in Cape Town are expected to rise by 0.25 degrees Celsius in the next 10 years. In Cape Town Day Zero never became a reality, but it could in the future if households, communities and governments are not actively utilising their groundwater resources before it is too late.💧

## Major dam levels in the Western Cape in the last week of August 2014-2018





## Well Projects Generate Critical Implementation Data

Since its inception in 2016, SADC-GMI has undertaken various groundwater projects which have been used as platforms to capture information regarding the particular areas in which the projects were operationalized. This was part of the SADC Groundwater Management Programme under a grant from the World Bank and Global Environmental Facility. In early 2018 they revisited the 7-pilot projects in Zimbabwe, Botswana and South Africa to gain more knowledge about the community, the solutions that were implemented and how community-based water supply management was carried out.

**“Whether the objectives of a project have been met or not, results are gained.”**

The pilot projects were implemented between 2007-2011 by the SADC Secretariat, with World Bank Funding. Some of the questions asked in the programme were what level of success the schemes showed, whether they had been abandoned and what the rehabilitation costs to bring the schemes back into operation were. During the evaluation, it was discovered that majority of the physical mediations were not neglected, they were rather found to be



**THE LIMPOPO BASIN** is one of the largest transboundary river basins in SADC with more than 1000 boreholes mainly used for irrigation.

### Some of the lessons learned from the evaluation are that:

- Post-intervention community support and monitoring is crucial even when there are community involvement and intervention management structures.
- Significant participation with other national/regional stakeholders throughout the primary intervention process is obligatory for long-term community-management and sustainability.
- An enlightening consideration from a SADC

*regional viewpoint is that the idea that one solution is suitable in all circumstances with regards to community-based water supply management and operation of relatively low-tech drought-proofing interventions is not workable uniformly across the region. Whether the objectives of a project have been met or not, results are gained. The information from these projects will be used by the SADC-GMI to inform future implementations across southern Africa.*

largely non-functional because of flood damage (sand dams), and poor community maintenance and dysfunction. The data obtained will

be used to inform future projects in the SADC region, improving implementations and the odds of success for future well projects. 💧

## SADC-GMI to Tackle Poor Data Systems



**UP-TO-DATE DATA ON SADC'S** groundwater resources is being collected, uploaded and shared on the SADC Groundwater Information Portal.

Limited and disparate information systems for managing data have been identified as a serious barrier for groundwater management and data collection in SADC. In 2016 the SADC-GMI commissioned a Needs Analysis Assessment to identify key areas that need to be improved or implemented to better empower stakeholders and decision-makers in Member States. According to Dr Kevin Pietersen, extraordinary lecturer at the University of the Western Cape who was involved in preparing the assessment, financial restraints and limited human resources have capped the expansion of better information systems. “Regulations to protect groundwater resources are often not in place and where these are in place, often no enforcement or sanction of unlawful activities takes place,” Pietersen said. Pietersen said information

systems for managing groundwater data hardly exist in most Member States. There has also been limited coordination with other sectors such as energy and mining. Where there has been implementation of groundwater management, the planning is weak.

**“Information systems for managing groundwater data hardly exists in most Member States.”**

- Dr Kevin Pietersen, Extraordinary Lecturer;  
University of the Western Cape

The assessment identified that having better information systems in place will allow for up-to-date data and better data accuracy, which can be shared between Member States and inform SADC-GMI's range of information stores. These data information systems will in turn

be able to inform stakeholders and decision-makers on groundwater management. The lack of better information systems, training, professional development, networking among groundwater experts and feedback among professionals are key obstacles for better management of groundwater in SADC. As a result of the assessment, collaborative research programs and training and capacity development programmes have been implemented by SADC-GMI. These programmes include the Capacity Building on Groundwater Data Collection and Management Programme, and the Professional Borehole Drilling Supervision Course. These programmes will become a vehicle for empowering and developing optimal groundwater management, data collection and information systems in SADC going forward. 💧





# Tapping In and Protecting

*Tebogo Gantsa spoke to the SADC-GMI Executive Director James Sauramba about SADC-GMI's significance for groundwater development in SADC and the importance of hosting the 1st Annual Conference on Groundwater.*

**A**t a glance, what is the SADC-GMI?

The institute is a subsidiary structure of the SADC secretariat that promotes sustainable and equitable groundwater management and use thereof in the 16 SADC Member States. What attracts people to our brand is that as a Centre of Excellence on groundwater we serve all stakeholders as a one-stop shop. We see ourselves as change agents and interlocutors who promote research that helps industries utilise data and not pollute groundwater.

**S**ince it was first established in 2016, what have been the milestones that you and the organisation have achieved?

SADC-GMI has trained more than 300 participants from SADC Member States and offered internships to 26 young groundwater professionals under the age of 35 on a wide range of topics which included international water law, managed aquifer recharge, effective borehole drilling supervision, and integration of groundwater into the river basin organisations, among other topics. As facilitator of transboundary projects we work with decision-makers at government and regional level by assisting with information that helps them make informed decisions on the conjunctive utilisation of the region's scarce water resources. Transboundary Aquifers are shared between Member States and we need a common code of practice for the utilisation of groundwater. Hence our

work in the past year or so was also anchored on awareness raising on these yet relatively obscure issues.

**T**his newsletter marks the very first conference. What is the overarching objective of the SADC Groundwater Conference?

We are trying to emphasise the importance of adaptation to the impact of climate change by offering innovative ways of utilising groundwater. We also want to assist the general populace in coping with the evidently devastating impacts climate change, experienced through the erratic cycles of severe droughts and floods experienced in the region nowadays. When dams and streams are drying

up people turn to groundwater which they can't see and have little information about.

**W**ho will we be seeing at this inaugural conference?

As a global platform we will have international groundwater experts such as officials from the SADC Secretariat and government ministries from across the region, UNESCO-IHP, IGRAC and the International Water Management Institute, the World Bank and GIZ as well as participants from the private sector coming to showcase their products. The SADC Subcommittee on Hydrogeology members, students, and people from research institutions including the South African Water Research Commission will also attend. Experts from the International Association of Hydrogeologists (IAH) will also grace the occasion and make inputs. The media will also be an important stakeholder.

**T**he theme of the conference is Adapting to Climate Change through water security - A Focus on Groundwater. What is the significance of this theme and why was it chosen?

Climate change demands integrated use of water resources. The concept of

conjunctive use is extremely important because when you deplete one resource, it affects the other. We are also cognisant of the fact that there are also areas where groundwater is over-utilised, this is what we call mining. In other areas groundwater is under-utilised. It is estimated that out of the abundant renewable groundwater resources in the SADC region only 1,5% is utilised. We want people to share knowledge on how to enhance water security through the sustainable utilisation of groundwater as a measure to promote regional socio-economic development.

**W**hy is it important to look at these issues through a groundwater lens?

SADC protocols and national policies and legislation, don't talk much about the significance of groundwater yet estimates are that about 70% of the population in the SADC region relies on groundwater. This has been an oversight on the part of all of us. We did not prioritise groundwater, we put most of our focus on surface water. Now we need to elevate this invaluable resource in our water security discourses.

**M**oving forward, what can we expect to see from the SADC-GMI?

We will continue developing solutions on pertinent

groundwater topics. Besides the research that we do, we also want to attract large-scale funding to support Member States in implementing large scale infrastructure projects. We see ourselves as an important driver of socio-economic development in the SADC region through enhancing water security and promoting value addition. Once you abstract water you can use it for domestic purposes, to support urban growth and industrial development, irrigation in the agricultural sector and to service demands in the mining sector. In this way you not only feed people but you also improve the livelihoods of the SADC population. That is where we intend to end up.

Mr James Sauramba 

## Young Experts Change Future of SADC Groundwater

A network of young experts from SADC Member States is key to developing data that can improve groundwater management, inform policy and influence decision makers. SADC-GMI is collaborating with the International Groundwater Resources Assessment Centre (IGRAC) and the Institute for Groundwater Studies (IGS) at the University of the Free State, to spearhead a programme empowering young experts with vital skills in data collection and management.

The programme is part of SADC-GMI's on-going capacity building initiative to better empower stakeholders. One of the young experts, Ruvimbo Pepukai (35), a hydrogeological technician for the District Development Fund in Zimbabwe, said the training equipped her with the skills to improve the way she performs her day-to-day activities. Now as she supervises borehole drilling, she pays careful attention to recording samples and managing data. Pepukai said one of the things that stood out for her during training was being taught how to make an instrument to measure water levels, a skill that she is passing on to her colleagues. "As I am moving through



**TRAINING DAY 2:** Ruvimbo Pepukai and a fellow trainee test their home-made groundwater dip meter. (SADC-GMI)

different districts in Zimbabwe I am teaching different water technicians how to measure water levels," she said. Now, she is always mindful of the importance of generating data. "As citizens of SADC we could design parameters where we

*"As I am moving through different districts in Zimbabwe I am teaching different water technicians."*

- Ruvimbo Pepukai (35), Hydrogeological Technician; District Development Fund, Zimbabwe

need to collect data," she said. Another key feature of the the programme is the degree to

which it encourages young experts to maintain contact and form the first generation of a network of groundwater professionals across SADC. Pepukai says the young experts have created a messaging group in which they communicate and share experiences and discoveries. As part of the programme the young experts are commissioned with assignments so they can start implementing the skills in their respective countries. The next training session is in November where they will receive feedback on their assignments. 💧

## Training Opportunity Brings Water to Rural School



**NZAME PRIMARY SCHOOL** pupils look at how deep the borehole newly drilled borehole is. (SADC-GMI)

Groundwater is a vital resource, perhaps even more for critical public facilities in rural areas such as schools and clinics. Drilling boreholes can be the most efficient way to provide these facilities with water. One of the borehole projects SADC-GMI has developed is in Nzame Primary School situated in Bloemfontein, Free State province. The school's principal, Mr Skosana, said once the borehole is operational it will ease the financial strain on their budget. Currently the school pays rates to the municipality for the water they use. Mr Skosana said: "Our budget can't keep up with the costs to pay the municipality rates for water. And sometimes if the water is closed in the vicinity the community members come

to the school to ask for water. We end up paying for water we didn't even make use of."

*"Our budget can't keep up with the costs to pay the municipality rates for water."*

- Mr Skosana, Principal; Nzame Primary School, South Africa

He said since the borehole is a natural resource it will help them focus their finances on educational related items. The need for a borehole was identified during a training initiative where SADC-GMI collaborated with the institute for Groundwater Studies and Central University of Technology (Bloemfontein). The drilling of the borehole was

used as a training opportunity in which all SADC Member States could take part. The Professional borehole Drilling Supervision course was run for five days (April 23 – 27, 2018) at the University of the Free State. The primary objective of the course was to provide participants with knowledge relating to Borehole Drilling and management. The fieldwork at Nzame Primary School exposed the trainees to Practical experience borehole drilling. The positive change brought by the borehole development will need measures put in place to ensure its sustainability. Some of these include sanitization, protecting the borehole with a tight-fitting head cap and avoiding the mixing of chemicals near the borehole. 💧



# Groundwater Keeps Lobatse Climate Resilient



US\$ 8.37 MILLION FROM the Emergency Water Security and Efficiency Project will be poured into infrastructure support for the area of Lobatse. (Campbell Easton, frayintermedia)

The small town of Lobatse in Botswana is a case study of much interest to SADC Member States looking to utilise groundwater in their climate change response strategies. In 1969 Lobatse, a town in the South of Botswana, was faced with an imminent crisis: two years of drought had left it with water reserves which would only last for the next 18 months. The drought caused devastation for the rural population of Lobatse for

whom 90% of income came from trade with the Botswana Meat Commission.

*“US\$ 8.37 million from the Emergency Water Security and Efficiency Project will be poured into infrastructure support for the area of Lobatse.”*

The Meat Commission itself was faced with possible closure. Botswana is frequently affected by El Niño

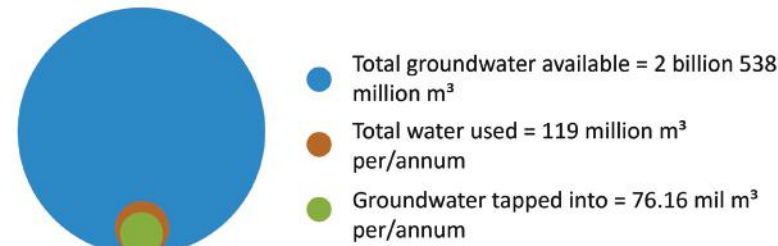
weather events, which brings periodic droughts causing severe water insecurity. The Gaborone-Lobatse Water Supply Project, made possible by a World Bank loan to Botswana, was implemented to improve water security through the drought years. This project saw pipes laid, connecting Lobatse with Gaborone’s water resources, but its success was short lived when in 1970, 1981, and 1990 further droughts hit Botswana, reducing the

capacity of Gaborone to support Lobatse. At the time, no official consideration was given to groundwater solutions, yet data from the time shows that Lobatse survived during those water scarce years due to an explosion in the number of small scale boreholes dug between 1975 and the year 2000. The SADC region has taken significant strides in its approach to drought resilience since then. Groundwater infrastructure solutions are now an integral

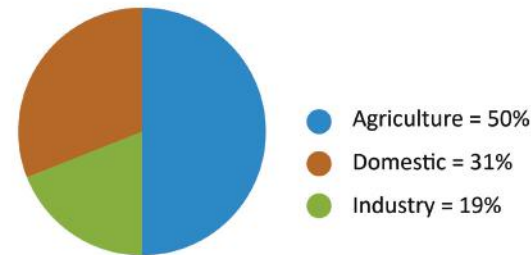
part of SADC-GMI’s, and the SADC Secretariat’s, approach to water security. When Botswana faced another El Niño drought in 2015, the worst since 1981, the solutions implemented built on the prior failure to consider groundwater as a solution. From the US\$ 160 million World Bank funded Emergency Water Security and Efficiency Project to rescue Botswana from the impact of El Niño, a portion of the funds will be dedicated

to groundwater management. For Lobatse these will involve US\$ 8.37 million poured into infrastructure support in Mmathethe and Mokatako, small towns in the area of Lobatse. The project includes plans to address climate change adaption, environmental health, pollution management and the reform of policies and water institutions. 💧

## Groundwater Available vs Groundwater Utilised in Botswana



## Water use by sector in Botswana



Data: Groundwater Management in the Southern African Development Community, sadc-gmi.org



# SPONSORS' AND ORGANISING PARTNERS

required for sustainable groundwater resource development, groundwater management and groundwater monitoring worldwide.

## Groundwater Management Institute (SADC-GMI)

SADC-GMI is a subsidiary structure of the SADC Secretariat. SADC-GMI's core mandate is to promote sustainable groundwater management and provides solutions to groundwater challenges in SADC through creating an enabling policy, legal and regulatory environment; capacity building; advancing research, supporting infrastructure development; and enabling dialogue and accessibility of groundwater information. [www.sadc-gmi.org](http://www.sadc-gmi.org)



## Department of Water and Sanitation (DWS)

The Department of Water and Sanitation is a custodian of South Africa's water and sanitation resources. The Department's strategic goals are: to be an efficient, effective and development orientated sector leader; equitable and sustainable provision of raw water; provision of equitable and sustainable water services of acceptable quantity and quality; and protection of freshwater ecosystems. [www.dwa.gov.za](http://www.dwa.gov.za)



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA



United Nations  
Educational, Scientific and  
Cultural Organization



International  
Hydrological  
Programme

## International Hydrological Programme (UNESCO -IHP)

UNESCO-IHP is the only intergovernmental programme of the UN devoted to water research, water resources management, and education and capacity building. Through one of its flagship programmes, the Internationally Shared Aquifer Resources Management (ISARM), more than 70 transboundary aquifers have been identified in Africa of which 28 are shared between two or more SADC Member States. [www.unesco.org](http://www.unesco.org)



## International Water Management Institute (IWMI)

International Water Management Institute is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. IWMI works in partnership with governments, civil society and the private sector to develop scalable agricultural water management solutions that have a real impact on poverty reduction, food security and ecosystem health. [www.iwmi.cgiar.org](http://www.iwmi.cgiar.org)

## International Groundwater Resources Assessment Centre (IGRAC)

IGRAC (International Groundwater Resources Assessment Centre) facilitates and promotes international sharing of information and knowledge required for sustainable groundwater resources development and management worldwide. Since 2003, IGRAC provides an independent content and process support, focusing particularly on transboundary aquifer assessment and groundwater monitoring. Read more about IGRAC's mission and objectives and organisation at [www.un-igrac.org](http://www.un-igrac.org)



International Groundwater Resources Assessment Centre

## Global Water Partnership Southern Africa (GWPSA)

The Global Water Partnership Southern Africa (GWPSA) is one of the 13 regional networks of the Global Water Partnership international network created to foster an integrated approach to water resources management (IWRM) for a water secure world. GWPSA offers practical advice for sustainably managing water resources specifically to 16 countries in the SADC region. [www.gwp.org](http://www.gwp.org)



Global Water  
Partnership  
Southern Africa



# SPONSORS' AND ORGANISING PARTNERS

required for sustainable groundwater resource development, groundwater management and groundwater monitoring worldwide.

## Groundwater Solution Initiative for Policy and Practice (GRIPP)

The GRIPP partnership, led by the International Water Management Institute (IWMI), strengthens, expands and connects current groundwater initiatives. It supports the Global Framework for Action developed by the Groundwater Governance Project funded by GEF and implemented by the UN Food and Agriculture Organization (FAO) together with UNESCO-IHP, International Association of Hydrogeologists (IAH) and the World Bank. [www.gripp.iwmi.org](http://www.gripp.iwmi.org)



# GRIPP

GROUNDWATER SOLUTIONS  
INITIATIVE FOR  
POLICY AND PRACTICE

## Pegasys Institute

Pegasys Institute is a value-based not-for-profit organisation that focuses on generating innovative ideas, advocacy, policy and strategy in the areas of natural resource use, water, climate change and infrastructure. [www.pegasys.co.za](http://www.pegasys.co.za)



## International Association of Hydrogeologists and the South African National Chapter (IAH-SA-NC)

The International Association of Hydrogeologists (IAH) is an international scientific and educational organization that aims to promote research and understanding of the proper management and protection of groundwater for the common good throughout the world. [www.iah.org.za](http://www.iah.org.za)



# IAH

  
SOUTH  
AFRICA

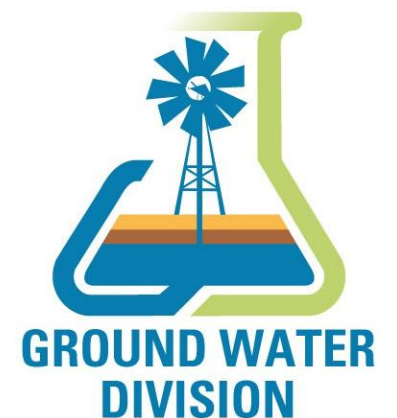

WATER  
RESEARCH  
COMMISSION

## Water Research Commission (WRC)

The Water Research Commission (WRC) is South Africa's premier knowledge hub. WRC provides the country with applied knowledge and water-related innovation. The strategic role of the WRC is therefore, to be continuously relevant and effective in supporting both the creation of knowledge through R&D funding and the transfer and dissemination of the created knowledge. [www.wrc.org.za](http://www.wrc.org.za)

## Ground Water Division (GWD)

The Ground Water Division is a body of scientists, academics and technicians with direct or indirect involvement or interest in the optimal development of the country's groundwater as a limited natural resource, and in the preservation of its quality. It is committed to upholding and promoting professionalism in the field of groundwater among its membership and strongly supports environmental consciousness. [www.gwd.org.za](http://www.gwd.org.za)



## Wellfield Geosciences Corporate (WCS)

WCS is the principal operating company of Wellfield Geosciences Group in the fields of groundwater resources evaluation, development and management. It also offers services in water quality monitoring and laboratory analysis, pollution studies, irrigation, mine dewatering, digital cartography and surveying, remote sensing, numerical modelling, and integrated water resources evaluation and development. [www.wellfieldgroup.com](http://www.wellfieldgroup.com)



# WELLFIELD

Groundwater, Engineering and Environmental Consultants



# IGS

  
INSTITUTE FOR  
GROUNDWATER  
STUDIES

## Institute for Groundwater Studies (IGS)

The institute conducts contract research on a water-related topics with a special interest in contributing to water management and minimisation of pollution in the mining and industrial sectors, as well as understanding the nature and behaviour of South Africa's aquifers. The institute provides a complete service through field investigations, the developing of specialised field equipment, a well-equipped commercial and water research laboratory and a number of computer models. [www.ufs.ac.za/natagri/departments-and-divisions/institute-for-groundwater-studies-\(igs\)-home](http://www.ufs.ac.za/natagri/departments-and-divisions/institute-for-groundwater-studies-(igs)-home)






## OUR MANDATE

SADC-GMI's core mandate is to promote sustainable groundwater management and providing solutions to groundwater challenges in the SADC region through creating an enabling policy, legal and regulatory environment, capacity building, advancing research, supporting infrastructure development, and enabling dialogue and accessibility of groundwater information.

## AREAS OF FOCUS

- Promoting sustainable access to groundwater through infrastructure development
- Creating an enabling Policy Legal and Regulatory for groundwater management
- Building Capacity at National and Regional levels
- Undertaking Research

## CONTACT

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