

Background to Groundwater in the SADC Region



GROUNDWATER MANAGEMENT INSTITUTE



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Groundwater is a fundamental resource for social, economic, and environmental sustainability across the 16 Member States of the Southern African Development Community (SADC). Human well-being, livelihoods, food security, ecosystems, natural habitats, industries, and the growing cities are directly reliant on groundwater. Despite the abundant availability of renewable groundwater resources in the SADC Member States (estimated at 2,491m³ /capita/year); only 1.5% of the groundwater is utilized even though there is over-abstraction in some aquifers. The region has an estimated 30 Transboundary Aquifers whose physical characteristics and groundwater potential are hardly known.

Groundwater is the primary source of water for 70% of the 345 million people living in the SADC region, more so with the increased pressure on water resources arising from climate variability, severe droughts, pollution, population growth and the regional socio-economic development agenda supported by the SADC. However, groundwater issues are often not granted equal priority in national and international water management discourses. The resource is often excluded in water planning, and there is shortage of skills to monitor compliance with abstraction standards. The SADC-Groundwater Management Institute continues to operate and exist as the Centre of Excellence for sustainable groundwater management and groundwater dependent ecosystems in the SADC region.



Photo's: Supplied by SADC-GMI

Who is SADC-GMI?

The Southern African Development Community Groundwater Management Institute (SADC-GMI) is established as a section 21 not-for profit company registered under the South African Companies Act No. 71 of 2008, as amended. The company is run by a Board of Directors composed of representatives from the SADC Member States, University of the Free State, Private Sector, SADC-GMI Executive Director and SADC Secretariat's Water Division as the Chair. It is hosted by the Council for Scientific and Industrial Research (CSIR) in Pretoria, South Africa on behalf of, and under the strategic guidance of the SADC Secretariat, Directorate of Infrastructure's Water Division, in Gaborone, Botswana. As a subsidiary structure of the SADC Secretariat, SADC-GMI draws its mandate from the fifth phase Regional Strategic Action Plan for Integrated Water Resources Management (RSAP V: 2021-2025).



Photo's: Supplied by SADC-GMI

Vision

SADC-GMI aspires “to be a Centre of Excellence in promoting equitable and sustainable groundwater management in the SADC region”

SADC-GMI's 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, knowledge generation through research,

supporting innovative infrastructure development, and enabling dialogue and accessibility to groundwater information for decision making. SADC-GMI also serves as a focal interlocutor with national, regional, and international groundwater initiatives.



Key Focus Areas

To achieve its objectives and fulfil its mandate, SADC-GMI operate with five areas of focus, listed below:

Creating an Enabling Policy, Legal and Regulatory Environment for Groundwater Management

To raise the prominence of groundwater in the national and regional policy, legal and regulatory frameworks, SADC-GMI is continuing to implement various initiatives which include gap analyses, benchmarking, action planning and advocacy, as well as rendering national level technical assistance for closing the gaps. This effort also focuses on aligning with the Revised SADC Protocol on Shared Watercourses of 2000 and river basin agreements across the region. Transboundary water cooperation through Transboundary Aquifers and shared River Basin Organizations is also a key focus area under this cluster.

Building Capacity at National and Regional Levels

Capacity building is one of the pillars and focus of the SADC-GMI. Independently or in collaboration with other key players in the water sector, SADC-GMI provides capacity building initiatives to public and private sector groundwater practitioners and decision makers across the 16 SADC Member States on several topics. Since its inception, SADC-GMI has offered capacity building on many topics including international water law, groundwater modelling, data collection and management, conjunctive water resources management, managed aquifer recharge, borehole drilling, Borehole forensics, Integration of groundwater management into river basin organizations in Africa, Online Data Collection and Data sharing among others. Our training interventions endeavour to respond to the national and regional capacity needs as identified in our Capacity Needs Assessment study and other subsequent studies.

Undertaking Research

In tandem with its core mandate to build a knowledge base for groundwater in the region, SADC-GMI prioritizes research that seeks to establish the full geophysical and scientific features and potential of the estimated 30 Transboundary Aquifers in the region. In this regard, research is undertaken on Transboundary Diagnostic Analyses which zero in on conjunctive water resources management, environmental sustainability, Groundwater Dependent ecosystems and Biodiversity, stakeholder involvement as well as transboundary policy, legal and institutional cooperation. The research component also incorporates groundwater data collection, analysis and information sharing to support the application of research findings. In this regard SADC-GMI collaborates with other regional and global partners to undertake and disseminate groundwater research.

Lead and Promote Regional Coordination, Across Various Spatial Scales, for Groundwater Management and Development

Cooperation at the regional or transboundary levels is often compounded with perceived and changing risks and opportunities among parties. In this regard, SADC-GMI focuses on both policy and technical aspects of groundwater to inform regional and transboundary dialogue on cooperation. Equally, SADC-GMI invests in analytical research, dialogue and cooperation that can help generate knowledge to unlock solutions for SADC Member States who share challenges and can benefit from opportunities derived from groundwater management in transboundary aquifers.

Promoting Sustainable Access to Groundwater through Infrastructure Development

SADC-GMI acknowledges that without appropriate physical infrastructure, sustainable access to and management of groundwater is not feasible. While implementing phase 1 of the Sustainable Groundwater Management in SADC Member States project (2016–2021), SADC-GMI implemented different infrastructure pilot projects for abstraction, recharge, monitoring, and protection of groundwater. During implementation of phase 2 of the Sustainable Groundwater Management in SADC Member States project (2021-2025), SADC-GMI continues to implement more infrastructure pilot projects to assist Member States to sustainably access groundwater resource. We believe that poor installation, operation, and maintenance of groundwater infrastructure inhibits the sustainable access and management of the resource. As such SADC-GMI highly prioritizes issues of ownership through community-based management of infrastructure.



Our Success Stories to date

Implementing the Sustainable Groundwater Management in the SADC Member States Project Phase 1

Through funding from the Global Environment Facility (GEF) and the Multi Donor Trust Fund Cooperation in International Waters in Africa, through World Bank SADC-GMI successfully implemented the Sustainable Groundwater Management in SADC Member States Project Phase 1. The project saw the implementation of various impactful initiatives in the SADC region across the Key Focus Areas discussed above. The project intervened to catalyse multi-state cooperation in balancing conflicting water uses particularly in transboundary groundwater basins, and prioritized climate variability, and change, as well as supported capacity building, and targeted needs for joint ecosystem-based management of transboundary water systems.

Implementation of Sub-Grant Scheme through National Focal groups

In the past few years, SADC-GMI successfully worked with National Focal groups composed of different key stakeholders in the groundwater sector within each SADC Member State to identify needs and to implement groundwater infrastructure projects in their respective country using the sub-grant scheme that was available through the SADC-GMI. This initiative culminated in the successful completion of 12 pilot projects in 10 SADC Member States. The projects implemented ranged from Integration of groundwater resources data system, deep aquifer exploration for water supply, groundwater monitoring systems, Identification, and characterization of local aquifers to augment water supply, rehabilitating of community water supply schemes for water and food security. Phase 2 of the Sustainable Groundwater Management in SADC Member States project offers another opportunity for SADC-GMI and Member States to collaborate further on even more innovative interventions for sustainable groundwater development.

Sharing Information and Knowledge through the SADC Groundwater Information Portal (GIP)

SADC-GMI has been collaborating with the International Groundwater Resources Assessment Centre (IGRAC) of the Netherlands, and other key partners since June 2017 to revive the SADC Hydrogeological Map and Atlas through the SADC Groundwater Information Portal (SADC-GIP), now available on the SADC-GMI website: www.gip.sadc-gmi.org. Since its launch, SADC-GMI has been continuously fine tuning the portal to ensure that it is user-friendly and contains up to date information to support stakeholders in the region to make decisions on the sustainable use and management of groundwater resources.

Capacity Building for Groundwater Data Collection and Management in SADC Member States

Since September 2017, SADC-GMI, in collaboration with the International Groundwater Resources Assessment Centre (IGRAC) and the Institute for Groundwater Studies at the University of the Free State, launched an ambitious project to address the glaring disparities for data collection and management existing across the Member States. Besides collecting up-to-date data that is used to update the SADC-GIP, the project also targeted on benchmarking and harmonizing data collection and management tools and practices. An internship programme involving 2 young professionals from each of the then 15 SADC Member States (excluding Comoros) was designed as part of the project. Culminating from the project was the SADC wide Framework on Data Collection and Management (2019) and the report on the State of Data Collection and Management in the SADC region. These two documents have been quite instrumental in enhancing understanding of data collection and management in the region.

Capacity building Partnerships

SADC-GMI acknowledges the need to build partnerships to leverage on ongoing capacity building initiatives. In this regard, SADC-GMI partnered with the United Nations Educational, Scientific and Cultural Organizations – International Hydrological Programme (UNESCO-IHP), the University of the Free State's Institute for Groundwater Studies (IGS), WaterNet and River Basin Organizations to deliver training interventions in several topics including International Water Law and Gender, Groundwater Modelling, Managed Aquifer Recharge - Windows Information System for Hydrogeologists (WISH), Integration of Groundwater into River Basin Organizations, and Groundwater Information Portal (GIP) Training. SADC-GMI also responded to the disparities that existed in drilling and data collection for boreholes in the region by partnering with IGS, WaterNet and the Africa Groundwater Network (AGW-Net) to develop a course on "Cost-effective Boreholes Drilling". More capacity building partnerships are in place with initiatives run by reputable institutions such as Deutsche Gesellschaft Für Internationale Zusammenarbeit (GIZ), United States Agency for International Development (USAID), Strathclyde University and the South African Water Research Commission.

Conjunctive Water Resources Management Research

In pursuit of its core objective to fill the Transboundary Aquifer knowledge gaps through research, SADC-GMI embarked on conjunctive water resources management research in the Shire River/aquifer system involving transboundary Diagnostic Analysis and stakeholder involvement for a strategic planning process to identify priority issues on transboundary cooperation. In collaboration with the International Water Management

Institute (IWMI), further research worked was undertaken and completed on the Tuli Karoo Transboundary Aquifer shared between Botswana, South Africa, and Zimbabwe. One other milestone in this area was the completion of the research work on the Eastern Kalahari Karoo transboundary aquifer. Over and above that, SADC-GMI continues to actively pursue opportunities for partnerships with several national, regional and international organizations in order to undertake more research to better understand transboundary aquifers in the region and to establish their potential.

SADC Groundwater Conference

Since the inaugural Groundwater Conference held in 2018, the Southern African Development Community Groundwater Management Institute (SADC-GMI) in collaboration with regional and international partners, to date have hosted four successful conferences in response to the very high dependence of human populations and ecosystems on groundwater in the region. The conference is held annually, with the primary objective of providing a platform for the advancement of knowledge sharing on sustainable management of groundwater at national and transboundary levels across SADC Members States. The past 4 conferences have been very successful attracting speakers and participants from within and beyond the SADC region.

Groundwater Dependent Ecosystems (GDEs) and Biodiversity in the Khakea/Bray Transboundary Aquifer

SADC-GMI with funding from the Biodiversity JRS Foundation is currently implementing a project in the Khakea/Bray transboundary aquifer shared between Botswana and South Africa. The project integrates GIS and remote sensing, hydrogeology, and ecology to generate data on the biodiversity of the Khakea/Bray transboundary aquifer and develop a database linking groundwater information to ecological health. This project aims to define the relationships between groundwater quality, groundwater levels, and the biodiversity in the TBA and ultimately encourage joint management of the Khakea/Bray TBA and other transboundary systems in the SADC region.

USAID-Resilient Waters Program and SADC-GMI Collaboration

SADC-GMI and United States Agency for International Development (USAID), through the Resilient Waters Program, have been collaborating over the last two years to unlock the value of groundwater in enhancing water security in the SADC region through the conjunctive development and management of surface and groundwater resources. The collaboration sought to create an enabling policy, legal and institutional environment for the sustainable conjunctive development and management of surface and groundwater resources within the four riparian Member countries of the Limpopo River Basin, namely, Botswana, Mozambique, South Africa, and Zimbabwe. This work entails the participatory development of roadmaps, which are strategic documents to address the gaps identified in the Policy, Legal and Institutional (PLI) Frameworks for groundwater management in the four riparian states respectively.

In acknowledging the dispersed occurrence of groundwater in diverse community level contexts, and the potential risks of gender and social exclusion in the access and management of groundwater resources, the SADC-GMI/ USAID Resilient Waters Program collaboration also has a component on Gender Equality and Social Inclusion (GESI).



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SADC-GMI's outlook

SADC-GMI is implementing the Sustainable Groundwater Management in SADC Member States project Phase 2. The project commenced in November 2021 and is anticipated to be completed in November 2025. The 4-year project builds on the achievements of Phase 1 project which was completed in June 2021 and it is being implemented under three key components:

- Capacity Building for Sustainable Groundwater Management
- Knowledge Development, Dissemination and Advocacy Building
- Resilient Livelihoods and Inclusive Groundwater Management

SADC-GMI will continue to build its brand as a Centre of Excellence for groundwater management and development by leveraging on previous and ongoing achievements in the region. In growing this brand, SADC-GMI will render niche services in training, research, project management, advocacy and institutional development that will simultaneously secure the institute's long-term financial sustainability.



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Our Partners

- SADC Member States
- International Cooperating Partners
- Regional partners
- Universities
- Civil society organizations
- Private Sector
- Non-governmental organizations (NGO)
- River Basin Organizations (RBOs)
- Research Institutions
- Drilling companies
- Communities



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