



CALL FOR ABSTRACTS

# 3<sup>rd</sup> SADC GROUNDWATER CONFERENCE

**THEME: Enhancing Water and Food Security through Sustainable Groundwater Development in the SADC Region**

**Windhoek Namibia**

Safari Lodge Hotel & Convention Centre

**9<sup>th</sup> - 11<sup>th</sup> of November 2020**



## BACKGROUND

The SADC region has about 280 million inhabitants of which 40% have no access to an adequate safe drinking water supply. The region is vulnerable to climate change because of amongst other reasons the heavy reliance on the agriculture sector, lack of resources to adapt, poor infrastructure, and weak institutional arrangements. The Water, Energy, Food and Ecosystems (WEFE) Nexus approach offers a way of increasing resilience to climate change. The integrated perspective provided by the WEFE Nexus may help to meet the needs of different water uses and ecosystem protection. Often overlooked is the role of groundwater in the WEFE Nexus dialogue, despite the realisation that with the advent of climate change, the world and the region are leaning towards an increased dependency on groundwater, from both national and transboundary aquifers as primary sources, for agricultural and domestic water supply.

Parts of sub-Saharan Africa make little use of its groundwater resources, which contributes less than 5% of total renewable water resource withdrawals for agriculture. Increasing water scarcity will be particularly difficult for smallholder farmers who produce 90% of Africa's food without having access to secure water supply infrastructure. Currently, only 6% of the total cultivated land in Africa is irrigated. It has been estimated that irrigation could boost agricultural productivity by 50% if efficient and sustainable water development as well as utilisation is adopted. Moreover, population growth and economic development will increase the demand for public water supply across sub-Saharan Africa, currently estimated at around 50 litres per capita, compared to 500 litres in the USA. The challenges of an increasingly variable and declining water availability situation will lead to greater pressure to exploit unrealised and little-known groundwater resources, particularly for rural smallholder farmers who will be under pressure from competing water users such as commercial agriculture, energy production and urban development.

The increasing dependence of urban settlements on year-round available groundwater, and considering the dwindling surface water resources and failure of centralised water reticulation infrastructure, calls for a paradigm shift in understanding the hydrogeology, city planning, institutional and legal interactions around bulk urban water supply. Coastal cities/urban centres are also increasingly becoming reliant on groundwater. Such reliance results in intensive abstraction, which often triggers saltwater intrusion and significant declining of water levels, thereby compromising the water security in these population centres in addition to threatening the integrity of the coastal ecosystems. It further reduces potential investment into sound water infrastructure for rural smallholder farmers to boost productivity and create opportunities for resource management, as focus remains on maintaining existing infrastructure and higher value uses of water.

Enhancing the contribution of groundwater in the WEFE Nexus requires that the understanding of hydrogeological systems is enhanced, the role of information systems in managing groundwater is brought to the fore, and groundwater governance frameworks are enhanced at both national and regional levels.

*This conference seeks to advocate for a more central and pronounced role for groundwater in the WEFE Nexus dialogue as a way of minimising shocks, risks and vulnerability to climate change. The conference will be offered parallel to the 8<sup>th</sup> Africa Water Week, and also align to the theme of the 8<sup>th</sup> Africa Water Week. Both the 3<sup>rd</sup> SADC Groundwater Conference and the 8<sup>th</sup> Africa Water Week (AWW8) are aimed at rallying Africa's water sector towards a common voice as the world prepares for the 9th World Water Forum (9WWF) to be held in Dakar, Senegal in March 2021.*



## SUB-THEMES

### SUB-THEME 1:

#### Sustainable Groundwater Use for a Food Secure SADC Region

Seventy Five percent (75%) of the income of rural households in southern Africa comes from small-scale farming under rainfed agriculture, making the rural population highly vulnerable to climate variability and change. Ten of the 15 SADC countries (Comoros not included) have less than 7% of total cultivated area under irrigation and, five of them less than 1% irrigation. To strengthen its agrarian economy, the SADC region intends to increase agricultural production by increasing the irrigated area from 3.5% to 7%. The vision to increase the irrigated area targets the smallholder farming sector because of its importance in food security and its vulnerability. The role of groundwater in attaining food security is therefore expected to increase. It is noted that groundwater use for irrigation is on the rise amongst smallholder farmers<sup>1</sup>. The potential for groundwater expansion has not been met in the region, for example South Africa does not utilise half of its potential.. Similar figures across sub-Saharan Africa indicate that groundwater irrigation in Africa could be increased sustainably by a factor of 20<sup>2</sup>. However,

Power requirements for abstracting groundwater for

agriculture are often met through central electricity grids or diesel or solar powered pumps.

Growing use of groundwater for irrigation might entail excessive abstraction thereby compromising the sustainability of the resource. Ensuring sustainable groundwater abstraction while expanding energy access and reducing running energy costs, e.g. through solar irrigation necessitates a sound understanding of the socio-economic systems and most suitable agricultural water management practices. When groundwater resources are accessed to provide for irrigation demand, the nexus between water, energy and food security is evident, with energy access and price being strong factors in farmer decisions on groundwater use.

Discussions under this theme will include the potential for groundwater irrigation in the region, the main opportunities for groundwater development for irrigation, development and testing of tools/procedures for determining the irrigation potential for groundwater resources, as well as the WEF cross sectoral challenges in developing groundwater for large and small-scale irrigation.

<sup>1</sup> Villholth, K.G. (2013) Groundwater irrigation for smallholders in Sub-Saharan Africa – a synthesis of current knowledge to guide sustainable outcomes. *Wat. Int.*, 38(4), 369–391, DOI: 10.1080/02508060.2013.821644.

<sup>2</sup> Altchenko, Y. and K.G. Villholth (2015) Mapping irrigation potential from renewable groundwater in Africa – a quantitative hydrological approach. *Hydrol. Earth Syst. Sci.*, 19, 1055-1067, DOI:10.5194/hess-19-1055-2015.



## SUB-THEMES

### SUB-THEME 2:

#### The Climate Change Challenge for Urban Water and Food Security: Threats and the Role of Groundwater

Like the rest of Africa, urban population growth in SADC is outpacing economic, social and institutional development. Unplanned urban population growth remains a serious threat to water security, especially in cities and informal settlements of sub-Saharan Africa. Kinshasa (Democratic Republic of Congo – DRC) is already classified as a megacity with a population exceeding the 10 million mark. Johannesburg (South Africa), Dar es Salaam (Tanzania), and Luanda (Angola) are emerging as megacities by 2030'. The high rate of urbanisation, which often exceeds 4% per year, is already putting strain on water infrastructure, poses problems for human and environmental health, and causes disparate socioeconomic development and access to water. To cope with the increased water demand, urban centres in the region are increasingly turning to groundwater as a source of public water supply systems because of the generally superior quality of the water as well as the ability to buffer shortages between the dry and the wet season and during prolonged droughts resulting from climate change.

Examples of main cities in the SADC region relying on groundwater include the city of Windhoek, Namibia, which has been abstracting from the Windhoek aquifer since the 1950s with water levels declines presently being addressed by large-scale managed aquifer recharge (MAR) schemes. In South Africa, the Grootfontein aquifer is important for water supply of the town of Mahikeng in the North West Province of

South Africa as well as for commercial agriculture in the Province. The water table, however, has fallen by up to 28 m as a consequence of over-abstraction since the 1980s<sup>3</sup>.

In Maputo, the capital of Mozambique, nitrate concentrations above 250 milligrams per litre (mg/L) in groundwater have been reported due to the widespread use of pit latrines and septic tanks that allow for constant infiltration of its content into the soil and eventually to groundwater resources. An assessment of the seasonal variations of water supply boreholes in the coastal areas of Dar es Salaam City, Tanzania, found that during the dry season the water quality was highly saline resulting mainly from seawater intrusion and agricultural activities. Saltwater was found mostly in the area within 2 km of the Dar es Salaam coastline, and the depth to the interface was ranging from 1.3 to 20 m. Instances of saltwater intrusion due to intensive groundwater abstraction are a feature of most coastal urban settlements relying on groundwater.

Discussions under this theme will focus around the role of groundwater in urban water supply, urban hydrogeology, pollution to groundwater in urban settlements, saltwater intrusion in coastal aquifers as a result of increased abstractions to meet urban water demand, conjunctive water use models for urban water supply, urban agriculture, including self-supply for domestic use, etc.

<sup>3</sup> Cobbing, J. (2018) The North West dolomite aquifers, South Africa: a stalled opportunity for water security and development. Colombo, Sri Lanka: International Water Management Institute (IWMI). 22p. (Groundwater Solutions Initiative for Policy and Practice (GRIPP) Case Profile Series 03). ISSN 2520-2391 (Print). DOI: 10.5337/2018.223.



**SUB-THEMES****SUB-THEME 3:****Enhancing the Contribution of Groundwater in the WEFE Nexus through Effective Groundwater Governance at National and Transboundary level**

A study by the SADC-GMI (2018) found that in most SADC-Member States, *“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. This is often exacerbated by limited coordination with other sectors such as energy and mining. Furthermore, the implementation of groundwater management action plans, where developed, is often limited and resource constrained”*.

In a needs assessment, the transboundary groundwater issues identified by Member States include weak institutional frameworks and lack of scientific data collection and sharing between countries. Most river basin organisations (RBOs) have incipient groundwater programmes and groundwater, but research is still limited. The Orange-Senqu River Commission (ORASECOM) structure makes provision for Technical Task Teams, which includes a Groundwater Hydrology Committee to oversee management of groundwater at transboundary level. This structure has so far been replicated by SADC-GMI in LIMCOM but not replicated in the other basins. It is hoped that such structures enhance cooperation on transboundary aquifers amongst the riparian nations.

Groundwater monitoring and reporting provides a solid basis for groundwater investments and governance interventions in the SADC region. It is however noted that the SADC region generally is characterised by a paucity of groundwater related data. Reasons for the lack of data include limited investment in monitoring and limited institutional capacity and planning around monitoring reduced budgets. Additional challenges related to groundwater data are poor quality of data, poor data storage practices, which do not make the data readily processable and accessible, lack of data sharing between sectors, etc. Hence, there is a need to promote monitoring, capacity development, and processing of groundwater data into usable information for policy makers.

The discussion in this sub-theme will be around the constitution of National Strategies and Focal Groups to spearhead the management of groundwater at national level, the role of Groundwater Committees in River Basin Organisations, financing groundwater management, among other key subjects of concern.



## SUBMISSION OF ABSTRACTS

Abstracts for both **oral and poster** presentation for the subthemes outlined above. Authors are requested to indicate the subtheme for which they are making submissions.

## ABSTRACT SPECIFICATIONS

Authors are requested to indicate whether the submission is for an oral or poster presentation. Abstracts should:

- have font: Times New Roman, font size: 11, line spacing: 1.5
- have a short title (concise and informative) that adequately captures the scope of the presentation. Authors are discouraged from using excessively long titles
- be written in English, French or Portuguese
- indicate the authors of the abstract and their affiliations, with the corresponding author clearly marked and contact details given
- provide the main results, the main conclusion, statement of the problem, objectives, methods, and results
- avoid using abbreviations
- be a maximum of 300 words
- provide keywords for the abstract (up to 5)

The Technical Committee reserves the right to reject or accept an abstract. By submitting an abstract, the authors commit that at least one author will attend the conference to present the paper/poster if accepted.

## SUBMISSION OF ABSTRACTS

Abstracts must be submitted online through the Easy Chair platform. To submit an abstract, follow the instructions Below:

- i. Click on this link. <https://easychair.org/conferences/?conf=2020-sadc-groundwater>
- ii. If you do not have an easy chair account, please create one as directed
- iii. When logged in, enter as an author
- iv. Follow instructions on filling out the form (making sure you paste the abstract in the space provided and also uploading the file as a pdf)
- v. After submitting your abstract, you will receive an email acknowledging receipt of the abstract.

## CONFERENCE PROCEEDINGS

The SADC-GMI and its partners will publish the proceedings of the conference. Experience has shown that there are numerous groundwater research products from the region, which fail to make it through to international journals. The proposed proceedings of the conference will, therefore, serve as a platform for sharing research outputs within the region and international community thereby further stimulating groundwater research and promoting budding researchers. The Technical Committee of the conference will constitute the editorial team of the proceedings.



## IMPORTANT DATES

### The following deadlines will apply:

Publication of Call for Abstracts	10 <sup>th</sup> April 2020
Close for receipt of Abstracts	30 <sup>th</sup> June 2020
Review of Abstracts and notification of Authors	31 <sup>st</sup> August 2020
Deadline for submission of full papers ( <b>Optional</b> )	9 <sup>th</sup> October 2020
First Draft of the programme	9 <sup>th</sup> October 2020
Confirmation by Authors	23 <sup>rd</sup> October 2020
Publishing of Final Programme	30 <sup>th</sup> October 2020
Conference run	9 <sup>th</sup> – 11 <sup>th</sup> November 2020

## REGISTRATION FEES AND DEADLINES

- Early bird registration (participants): US\$ 400 (Before the 22<sup>nd</sup> of August 2020)
  - Authors: US\$ 400 (Throughout )
  - Normal registration: US\$ 450 (Before the 30<sup>th</sup> September 2020)
  - Late registration: US\$ 500 (After 23<sup>rd</sup> October 2020)
  - \*Exhibitors: US\$ 1000 (Before the 31<sup>st</sup> September 2020)
  - Young professionals US\$ 100 (Below 35 years old)
  - Student registration: US\$ 100
- \*Exhibitors fee includes one delegate registration fees

## PAYMENT DETAILS

Payments are to be made through the account below.

- BANK: Standard Bank
- Account Name: Southern African Development Community-  
Groundwater Management Institute
- Branch: Brandwag
- Branch Code: 055534
- Branch Code (Electronic Payments): 051001
- Account Number: 421376031
- SWIFT: SBZAJJ

## REGISTRATION

Online registration can be done on <http://conference.sadc-gmi.org/3rd-sadc-groundwater-conference/>

## ENQUIRIES

Please send all enquiries about the conference to [conference@sadc-gmi.org](mailto:conference@sadc-gmi.org) or [Thokozani@sadc-gmi.org](mailto:Thokozani@sadc-gmi.org)

## TRAVEL AND ACCOMMODATION

All delegates attending the conference should organize their travel and accommodation.



**CONTACT DETAILS:**

**Physical address:**

Institute for Groundwater Studies, Dean Street, University of the Free State, 205 Nelson  
Mandela Drive, Bloemfontein, South Africa

**Postal address:**

Internal Box 56, P.O. Box 339, Bloemfontein, 9300, South Africa

**Thokozani Dlamini**

+27 51 401 7722

PVC · 051 448 5832



**GROUNDWATER MANAGEMENT INSTITUTE**

Follow us on the following social media platforms for regular updates on the Conference.

