



First call for Abstracts

# 21<sup>st</sup>

WaterNet/WARFSA/GWP-SA  
Symposium on

*Integrated Water Resources Management for Sustainable Development  
in Eastern and Southern Africa*

## Jointly convened with:

International Association of Hydrological Sciences (IAHS),  
Southern Africa Centres for Water Excellence (SANWATCE),  
Africa-EU Innovation Alliance for Water and Climate (AfriAlliance) and  
the Local Organizing Committee led by the National University of Science and Technology, Zimbabwe

With support from the Government of Zimbabwe

Elephant Hills Resort  
Victoria Falls  
Zimbabwe

28<sup>th</sup> – 30<sup>th</sup> October 2020



## Background

The 21<sup>st</sup> WaterNet/WARFSA/GWP-SA Symposium will be held in Victoria Falls, Zimbabwe 28<sup>th</sup> – 30<sup>th</sup> October 2020 under the theme **Integrated Water Resources Management for Sustainable Development in East and Southern Africa**. The National University of Science and Technology is the lead host of the 21<sup>st</sup> Symposium.

The Symposia have been held annually in the Eastern and Southern African regions for the past 20 years to promote interaction among policymakers, academics, practitioners from water and related sectors, and cooperating partners. Together, they identify regional issues, gaps and priorities that require further research and support. Great emphasis will be placed on integration of knowledge, particularly involving scholars from the natural and social sciences.

The sub-themes of the symposium have been aligned to the themes of the SADC Water Research Agenda under the Regional Strategic Action Plan on Integrated Water Resources Development and Management Phase IV, whose main objective is:

- Promoting evidence-based implementation of SADC water programmes and projects through multi- and interdisciplinary research, and synthesis of existing and new information, which will lead to a realisation of SADC developmental goals.

## Sub themes

Policymakers, academics, practitioners from water and related sectors, and cooperating partners are invited to register for and attend the symposium and make use of this opportunity to listen and debate findings from presentations focused on the different sub-themes. Authors wishing to present the results of their work should submit their abstracts targeting the topics detailed on the following page.

## Innovative approaches, practices and technologies for affordable water supply, and sanitation services

Limited access to safe drinking water and basic sanitation is a global problem, but one which is particularly huge in Africa in general and Eastern and Southern Africa in particular. An estimated 40% of the population in Sub-Saharan Africa and



approximately the same population in Eastern and Southern Africa have limited access to clean drinking water. Africa lags behind other continents in the area of access to improved sanitation which stands at 31% of the population. In Southern Africa, 62% of the population, i.e. almost two thirds of the total population - lack access to basic sanitation. As a result of limited access to clean water supply and sanitation in Sub-Saharan Africa, 842 000 adults and 120,000 children under the age of five die every year in the region from diarrhoea caused by unsafe water and poor sanitation. Cholera outbreaks have been experienced in the SADC region in recent years. The health of members of society is highly dependent on both the quality and the availability of water, and on how well this precious resource is managed..

With regards to sanitation, wastewater treatment, Africa has not been able to keep pace with rapid population growth and urbanization. Population growth, urbanisation and relative improvement in lifestyles in Africa have resulted in a rise in water consumption and an increase in discharge of wastewater. Untreated wastewater pollutes surface and groundwater and may lead to a myriad of diseases and illnesses resulting in deaths of the young and the elderly and vulnerable people. Africa treats only 1% of wastewater to secondary level. There is an urgent need for appropriate technologies for treating wastewater, including considering wastewater as a useful resource which can be recycled and used for productive purposes.

In addition, solid waste is not collected systematically or using proper disposal methods and poses a health hazard to residents and the environment. New and innovative approaches are required in the area of wastewater management to alleviate these challenges.



Ensuring access to clean water supply and improved sanitation in Eastern and Southern Africa will go a long way in achieving a number of the sustainable development goals such as poverty eradication and hunger (goals 1 and 2), good health and wellbeing (goal 3), quality education (goal 4), gender equality (goal 5), clean water and sanitation (goal 6), reducing inequality (goal 10) and sustainable cities and communities (goal 11). There is also a need to come up with innovative approaches, practices and technologies in order to achieve adequate water supply and sanitation services for all. The challenge is to identify affordable technologies that are appropriate and accepted by the intended beneficiaries across Eastern and Southern African regions.

Papers in this sub-theme should address sustainable water supply and sanitation development, technological advances in water supply, reuse and recycling, sanitation, water utility management and linkages to public health.

### **Water governance for sustainable, equitable and affordable water services**

The 21<sup>st</sup> century has witnessed the unfolding of multiple water challenges which require a substantial shift in the way water resources are governed. A multiplicity of factors which include climatic and hydrological conditions, population growth, rural–urban migration, increased per-capita water use, pollution and over-abstraction of groundwater have created a global water crisis which has made efficient and effective water governance a challenge in Africa in general and Eastern and Southern Africa in particular. The global water crisis has thus been defined as a crisis of governance, that is, the failure of water institutions to manage the resource for the well-being of humans and ecosystems.

Countries in the Eastern and Southern Africa regions are at different stages in putting in place policies and legal frameworks that promote integrated water resources management. Some countries started implementing legal water reforms underpinned by IWRM provisions more than 20 years ago while others started the process later while others have not yet reformed their water sectors. These different stages need a closer analyse in terms of how the policies and legal frameworks of those countries which have been implementing water reforms related to IWRM have impacted

on sustainable water resources management viz-a-vis those which have not started the process. The question which need to be answered in this regard relates to IWRM related reforms and sustainable water resources management.

The SADC region has made great strides in transboundary water governance as the Revised Protocol on Shared Watercourses is in place, as well as a number of transboundary water agreements which have resulted in the setting up of commissions such as those for the Zambezi, Limpopo, Orange-Senque, Okavango and Cunene basins. It is vital to analyse the extent to which these River Basin Organisations are enhancing the management of shared watercourses and how they are implementing the different provisions of their agreements. The challenges which they are facing need to be identified and discussed, including institutional strengthening, creation of services that add value to stakeholders in riparian states and sustainable financing of their programmes to reduce dependence on donor financing.

Good water governance is intended to enhance the human right to water and sanitation. This emphasises the principle that all people have the right to safe drinking water, sanitation, shelter and basic services. The human right to water is indispensable for leading a life in human dignity. This right is a prerequisite for the realisation of other human rights. Corruption and lack of accountability take away essential financial resources and have become key factors in the high cost, poor quality and even lack of water and sanitation services. In this and other ways they infringe on these human rights and contribute to poor performance against sustainable development goals.

This sub-theme calls for papers which address issues related to appropriate water governance arrangements at different levels, (regional, national and local), stakeholder participation in water

management at various scales, legal and policy frameworks for water management and their effectiveness and water service delivery models as well, differentiated pricing/subsidisation/incentives and the human right to water.

## **Water, Land, Energy and Agriculture**

Agriculture is the largest consumer of the world's freshwater resources, and more than one-quarter of the energy used globally is expended on food production and supply. Agricultural is by default land-based and there is competition for available land to live on and to grow food. Water, energy and land are therefore key resources required for sustainable living and livelihoods. Population growth, rapid urbanisation, changing diets and economic development are some of the factors driving increased demand for water, energy and land, which compete with agriculture. The inter-linkages between the three resources form a nexus, which needs to be better understood.

Feeding a global population expected to reach 9 billion people by 2050 will require a 60 percent increase in food production. There is, thus, a need to enhance agricultural production, sustainable land use and water resources through improved land tenure, management, development and conservation. Meeting the demand for agricultural products while reducing the demand for and protecting quality of land and water quantity and quality is a major challenge in most regions.

The proportion of irrigated area as a fraction of the total arable land is low across the SADC region. Water and energy demand for agricultural is set to increase. Better methods of accounting for biophysical resources and their utilisation are required. However, the assessment is based on crude methodologies, which are badly in need of revision. Biophysical resources that need to be assessed include determination of irrigation potential vs arable land, suitability of agricultural performance indicators (water use efficiency, water productivity), and water use by various land uses (such as forestry, biofuel feedstock).

Access to energy is essential for the reduction of poverty and promotion of economic growth. Agricultural improvement and expansion of municipal water systems all require access to abundant, reliable, and affordable sources of energy. The applications of renewable energy technology has the potential to alleviate many of the problems that face Africans every day,



especially if done so in a sustainable manner that prioritises human rights. However, the use of renewable energy for irrigation purposes is still very low across Eastern and Southern Africa.

The papers under this theme should focus on the interaction between land, water and energy as an important nexus that needs to be clearly understood, particularly the use of solar energy, rain-fed vs irrigated production and other best practices to reduce pressure on the strained water resources systems. How can water, land and energy be managed in an integrated manner in the face of increased water scarcity, dominance of water use for agriculture, and need for energy (including renewable energy) to treat and pump water?

## **Changing hydro-climatic regimes and planning tools for climate resilient development pathways**

Climate change and variability is influencing the available water resources in river basins across the Eastern and Southern African regions. Changes in climatic variables, especially precipitation and temperature, affect hydrologic processes, such as evapotranspiration, runoff generation and groundwater recharge. This also affects water demand patterns and biophysical processes in rivers, lakes and wetlands. Due to the diversity of the national and transboundary catchments throughout the Eastern and Southern African regions, the effects of climate change and variability are not uniform and local impacts are poorly understood. The regions already experience large rainfall variability on both intra and inter-annual timescales. Long-term drought and famine events, which have struck these two regions within the last 30 years, illustrate the impact of such variability on water resources.

Given the current hydro-climatic changes taking place, there is

need for efficient and effective water management based on accurate assessment of the available water resources. However, spatial and temporal distribution of hydrometric and meteorological stations across Africa is declining. Limited hydrological data availability coupled with complex hydrologic and hydrogeological systems has made prediction, planning and management of surface and groundwater resources under changing conditions a challenge. The theme focuses on how best to utilise existing data, and how newer technologies, such as remote sensing, local knowledge systems and big data can improve assessment of both surface and groundwater including transboundary water resources.

The papers in this sub-theme therefore should focus on addressing issues on enhancing efficient and effective assessment of water resources (including real time monitoring against a backdrop of uncertainties in a changing climate and socio-economic conditions), planning and management of surface and groundwater resources and the impact of climate change on water resources and agricultural production using appropriate models.

## **Water, Ecosystems and the Environment**

Ecosystems (e.g. forests, wetlands and grasslands) and the environment are critical components of the global water cycle. All freshwater ultimately depends on the continued healthy functioning of ecosystems and the broader environment and recognising the water cycle as a biophysical process is essential to achieving sustainable water management. Biodiversity within inland water ecosystems is both highly diverse and of great regional importance to livelihoods and economies. However, development activities are not always cognisant with the conservation of this diversity and it is poorly represented within the development planning process.

All countries in Eastern and Southern Africa now increasingly realise that greater investments are needed to protect aquatic ecosystems and the environment from the negative impact of human developments. On the other hand, implementation of the polluter pays principle is either very slow or non-existent. Integration of ecosystem needs into water management practices empowers decision makers to engage major productive water users with the clear end goal of sustainability. Addressing the challenge of striking the right balance between



allocating water for direct human use (agriculture, power generation, domestic purposes and industry) and indirect use (sustenance of ecosystem goods and services) in view of global challenges such as urbanisation and climate change become less subjective. Improved understanding of the linkages between the various water sources and uses, which implies recognising the existence of, not just hydrological boundaries, but ecosystems boundaries both at the national and transboundary levels is critical.

The papers in this sub-theme should address new and innovative methodologies for determining environmental water requirements, recent advances and best practices in environmental impact assessment, valuation of ecosystems services and goods, determining ecosystems boundaries, inclusion of ecosystem goods and services in water resources development, pollution prevention and treatment and river basin management, wise use of water-linked ecosystems and people's livelihoods, as well as studies of water quality in the IWRM framework.

## **Development and Sustainable Implementation of Resilient Water Infrastructure**

Infrastructure that supplies water for multiple uses, and delivers adequate sanitation should be robust and resilient if it is to continue to provide vital services in a changing biophysical and socio-economic environment.

The SADC region endeavours to develop water infrastructure that will play a pivotal role in deepening regional integration and addressing poverty whilst ensuring environmental sustainability. According to the SADC's Regional Infrastructure Development Master Plan, the region has adequate water resources for productive and domestic purposes. However, the

major challenge is that only 14% of the available renewable water resources are stored, of which 10% is retained in the Kariba and Cahora lakes respectively, which are both on the Zambezi River. Of the estimated total of 2 300 km<sup>3</sup> /year of renewable water resources available, the current level of abstraction is only 44 km<sup>3</sup> /year or 170 m<sup>3</sup> /capita/year; 77% of which is used for irrigation, 18% for domestic purposes and 5% is for industry.

The theme explores experiences in the development and the management of water infrastructure at the regional, national and local levels. Regional and national levels issues at the fore include infrastructure development, financing options for water infrastructure and guidelines for infrastructure sharing, i.e. operating, maintenance, sustainable utilisation of surface and ground water and regulation of reservoir activities whilst considering environmental flow requirements. Local level issues include the current state of water supply and sanitation infrastructure for rural, urban and peri-urban areas as well as innovative technological interventions such as the use of telemetry in water supply.

Papers in this sub-theme should include innovations demonstrated by best practises, experiences in water resources planning and management, infrastructure designs, optimisation of distribution networks for reliable and sustainable supply and river basin management at different institutional and spatial scales in the context of rapid change and development.

## Abstracts

Authors are invited to submit their abstracts for presentation at the symposium for oral, poster or special session presentations. Abstracts should be:

- A maximum of 350 words (Do not exceed the number of words as the system will not accept more than 350 words).
- The format for all text should be font size 12, Times New Roman and single-spaced.
- The title should be no more than 16 words in title case.
- Author's names should be written in such a way that the initials appear first followed by the last name.
- The authors names should indicate one corresponding author\* (with an asterisk) and the email of the corresponding author.



- The affiliations of authors should be shown through letter superscripts (such as a, b, c).
- Five keywords should be included in alphabetical order.
- The abstract should include a clear statement of the theoretical issue to be addressed, the research methodology to be presented, and a concise summary of the findings and conclusion.
- Work must be unpublished at time of presentation.
- Maximum of 3 submissions per author, either as single author or joint co-author are allowed

## Submission of Abstracts and Papers

All abstracts will be handled and reviewed electronically via the conference's EasyChair submission

<https://easychair.org/conferences/?conf=21wnsymp>.

Note that you will need to set up an EasyChair account (if you do not already have one) before you login for your submission. Several roles have been set on the platform for the 21<sup>st</sup> WaterNet/WAFSA/GWP Symposium, kindly register as an author, all other roles will be done through invitation. When completing the submission form on EasyChair, you will see a space which asks for an abstract to be typed in or pasted. Kindly copy and paste your abstract here. Further down the page you will upload your full abstract as a pdf attachment. You should receive confirmation of submission of your abstract from EasyChair immediately after submission by email; if you have not, please bear in mind that any emails received might be found in your spam folder.

The submission form in EasyChair also asks you:

- Your theme, your preferred presentation type/paper or a poster (note that the final decision will be taken by the programme committee)

- Whether you are under 35 years old
- Any keywords that do not appear in the topics list that may facilitate the review process

## Selection Criteria

All abstracts submitted for oral/poster presentation will undergo a peer review process and the results will be communicated to the corresponding author. By accepting an invitation to present a paper, the author or at least one co-author commits to attending the conference.

## Elservier Journal of Physics and Chemistry of the Earth (JPCE)

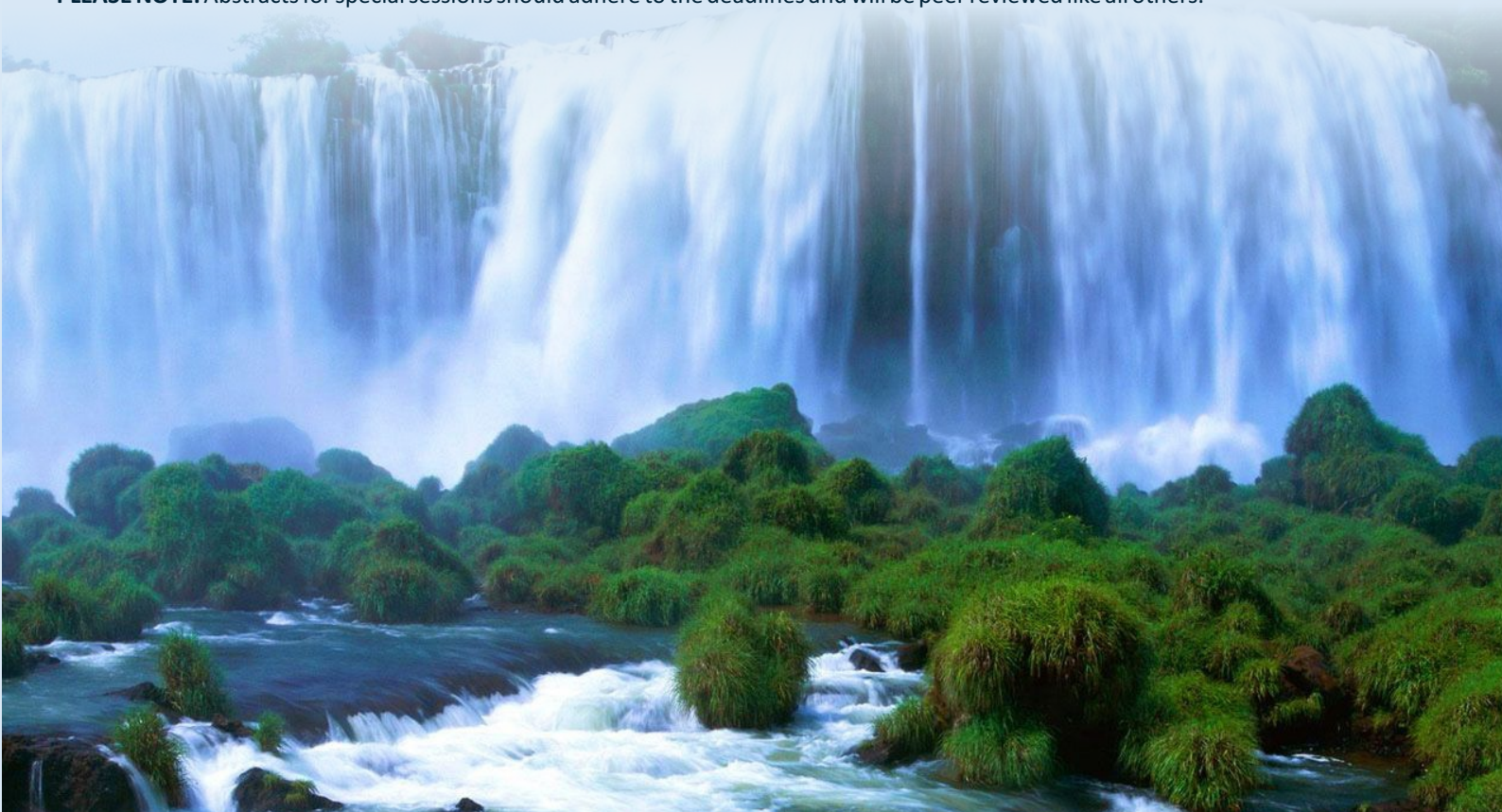
After the symposium authors will have an opportunity to submit their papers for review and publication in a special edition of the Journal of Physics and Chemistry of the Earth. It is a journal published by the Elsevier and the normal peer review process will apply. Guidelines for submitting a paper to this journal are available [HERE](#):

Submissions will be via online. More details on submission will be announced at the symposium.

## Special Sessions

All organisations interested in convening special sessions should submit their proposals on the digital platform as well. Please note that you will be required to show the relevance of the workshop to the symposium and the expected number of participants. The proposals need to be motivating, and will be allocated on a first come/first served basis. Each special session will be allocated approximately two hours. However, if more time is required the organisers should state this in the proposal. The proposal should state the materials and equipment that will be required.

**PLEASE NOTE:** Abstracts for special sessions should adhere to the deadlines and will be peer reviewed like all others.





## AfriAlliance Final Conference

This year, the 21<sup>st</sup> WaterNet/WARFSA/GWP-SA is proudly hosting the final AfriAlliance conference. AfriAlliance is a 5-year project funded by the European Commission aiming to facilitate the collaboration of African and European stakeholders in the areas of water and climate innovation, research, policy and capacity development in order to enhance the preparedness of Africa for future climate change challenges. The project consortium is made of 16 institutions from Africa and Europe working in the water and climate space. AfriAlliance is in its final year and invites students, policymakers, academics and practitioners from water and related sectors to the final conference.

The objectives of the AfriAlliance final conference are:

- To showcase innovations for the needs of African stakeholders
- To foster mainstreaming of innovation by water and climate governance and appropriate financing mechanisms
- To identify communication and coordination mechanisms for enhanced engagement between Africa and Europe for water and climate
- To ensure sustainability and uptake of AfriAlliance outputs for stakeholders (working in water and climate) in Africa and Europe







## Important Dates and Registration Fees

### Deadlines

Deadline for submission of abstracts	31 May 2020
Notification acceptance of abstracts	30 June 2020
Deadline for early bird registration	31 July 2020

### Registration fees

<b>Early bird registration</b> <i>Payable by 31 July 2020</i>	<b>USD 450.00</b>
<b>International student registration</b>	<b>USD 350.00</b>
<b>Zimbabwe based student registration</b> <i>Payable by 30 September 2020 (Proof of studentship to be provided)</i>	<b>USD 300.00</b>
<b>Normal registration</b> <i>Payable by 30 September 2020</i>	<b>USD 470.00</b>
<b>Late registration</b> <i>Payable after 1 October 2020</i>	<b>USD 550.00</b>
<b>Exhibitions</b>	<b>USD 800.00</b>
<b>Special sessions</b> <i>Payable by 30 August 2020</i>	<b>USD 800.00</b>

### Payment details for International Participants

<b>Bank Name:</b>	Stanbic Bank Botswana Limited
<b>Branch:</b>	Fairgrounds
<b>Branch Code:</b>	064967
<b>Account Name:</b>	WaterNet Trust
<b>Account Number:</b>	9060002591915
<b>Swift Code:</b>	SBICBWGX
<b>Account Type:</b>	USD
<b>Bank Postal Address:</b>	Stanbic House, Plot 50672, Old Machel Drive Fairgrounds, Gaborone, Botswana

Kindly generate an invoice [HERE](#)

Request for an invoice from [symposium20@waternetonline.org](mailto:symposium20@waternetonline.org) or [waternetonline@gmail.com](mailto:waternetonline@gmail.com)

**Online Payments** (MasterCard, Visa, PayPal): [HERE](#)

### Registration

Online registration can be done [HERE](#)

### For further information:

More information on the Symposium is available [HERE](#).

### Travel and Accommodation

All delegates attending the symposium should secure accommodation early. Travel arrangements will also need to be done on time. More information on accommodation and travel is contained in the Zimbabwe brief which can be found [here](#).

### Payment details for local (Zimbabwe) Participants

<b>Bank Name:</b>	Stanbic Bank Zimbabwe Limited
<b>Branch:</b>	Belgravia
<b>Branch Code:</b>	03103
<b>Account Name:</b>	WaterNet Trust
<b>Account Number:</b>	9140000998272
<b>Swift Code:</b>	SBICZWHX
<b>Account Type:</b>	USD
<b>Bank Postal Address:</b>	PO Box MP600, Mount Pleasant, Harare, Zimbabwe