

First call for Abstracts

19th WaterNet/WARFSA/ GWP-SA Symposium on

Integrated Water Resources Development and Management:
Managing Water for the Future in a Changing Environment in
Eastern and Southern Africa

Background

The 19th WaterNet/WARFSA/GWP-SA Symposium will be held in Livingstone, Zambia from the 31st October – 2nd November 2018 under the theme Integrated Water Resources Development and Management: Managing Water for the Future in a Changing Environment in Eastern and Southern Africa. The University of Zambia is the lead host of the 19th Symposium.

The Symposia have been held annually in the Eastern and Southern African regions for the past 18 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 those of the SADC Research Agenda under the Regional Strategic Action Plan on Integrated Water Resources Development and Management Phase IV. It is intended that researchers identify themes under which their projects fit within the SADC

*Jointly convened with the International
Association of Hydrological Sciences (IAHS)
and the Local Organizing Committee
led by the University of Zambia*

*with support from the
Government of Zambia*

*Avani Victoria Falls Resort,
Livingstone, Zambia
31st October – 2nd
November 2018*



Research Agenda, and thereby contribute to its main objective which is:

- Promoting evidence-based implementation of SADC water programmes and projects through multi- and inter-disciplinary 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 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 sub-themes detailed below.

Development and Sustainable Implementation of Resilient Water Infrastructure

The development of water infrastructure in Eastern and Southern Africa is of decisive importance for economic growth and poverty eradication. While SADC has made significant progress in regional infrastructure development, there is still an unacceptably high number of citizens without access to safe drinking water, adequate sanitation and water for irrigation to improve systems for agricultural production which contribute to food security.

Water security underpins the achievement of development agendas across many sectors such as health, energy, agriculture, environment, mining, and other industries. Water infrastructure plays a critical role in ensuring water security. 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 development of climate resilient water infrastructure is of paramount importance as this will ensure development progress and avoid investment in infrastructure which underperforms, or fails due to climate risks. Resilience is more than engineering design and can be viewed from a number of perspectives, from strategic national or basin level planning, through the project identification process, down to the detail of the engineering design process.

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.



The theme explores experiences in the development and the management of water infrastructure at the regional, national and local levels. Regional and national level issues at the fore include appropriate infrastructure development (e.g. for domestic water supply, small and large scale irrigation, mining and energy) 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.

Water for Health, Livelihoods and Economic Development

Water scarcity or lack of safe drinking water is one of the world's leading problems affecting more than 1.1 billion people globally, meaning that one in every six people lacks access to safe drinking water. 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. An estimated 174 million people in southern Africa, i.e. almost two thirds of the total population - lack access to basic latrines, while more than 100 million go without clean drinking water. Some 120,000 children under the age of five die every year in the region from diarrhoea caused by unsafe water and sanitation

Sub-Saharan Africa in general and Eastern and Southern Africa in particular suffer from chronically overburdened water systems under increasing stress and scarcity from decreased rainfall due to climate change and variability, fast-growing urban areas, increased demand from different sectors. Weak governments, corruption, mismanagement of resources, poor long-term investment, and a lack of environmental research and urban infrastructure only exacerbate the problem. Water related diseases such as cholera are now common across Eastern and Southern Africa.

The region is grappling with impacts of urbanisation and the mushrooming of peri-urban areas, most of which lack adequate water supply and sanitation infrastructure. Urbanisation is putting pressure on existing water supply and sanitation systems which were constructed for population numbers which are now exceeded. However, better access to clean water, sanitation services and water management in urban areas creates tremendous opportunity for the poor and is a progressive strategy for economic growth.



Freshwater scarcity in Africa is further aggravated by wastewater treatment challenges, which cannot 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. Wastewater facilitates surface and underground water pollution which may lead to a myriad of diseases and illnesses resulting in deaths of the young and the elderly and vulnerable people. At least 1.8 million children under the age of 5, die every year due to water related diseases linked to wastewater. Africa treats only 1% of wastewater to secondary level. It is important for Eastern and Southern Africa to reflect on the urgent need for appropriate technologies for treating wastewater in order to minimize negative impacts on human health and the environment and to consider wastewater as a useful resource which can be recycled and used for domestic and productive purposes.

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

Water Governance and the Human Right to Water

The 21st century has witnessed the unfolding of multiple water challenges which require a substantial shift in the way natural resources in general and water resources in particular are managed. The global water crisis has 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. The provision of water infrastructure by itself does not guarantee the envisaged positive social outcomes. The interaction of the various persons that are involved as individuals and groups through various institutional arrangements is key and should be understood.

Issues that need to be examined include identifying perverse and performance-enhancing incentives, accountable financing and operational arrangements, costs of water supply, accountability and stakeholder participation.

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 is in acknowledgement that clean drinking water and sanitation are essential to the realisation of all human rights. In pursuant to this, states and international organisations are committed to provide financial resources, enable capacity-building and technology transfer to help countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking water and sanitation for all. The human right to water is fundamental to leading



a life in human dignity and is a prerequisite for the realization of other human rights.

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/subsidization/incentives and the human right to water.

Water, Land, Energy and Agriculture

Water, energy and land are some of the key resources required for sustainable living and of livelihoods. Population growth, rapid urbanization, changing diets and economic development are some of the factors driving increased demand for water, energy, land and food. Water is the basis for all development and without it there can be no life. Energy is the input to most economic activities. All activities are land based and there is competition for available land to live on and grow food. Thus, inter-linkages between the three form a nexus. 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. 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 ensuring sustainability 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. 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), 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 abundant, reliable, and cost-effective energy access. 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 prioritizes 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 look into policies, programmes, tools and best practices for water use in irrigation, soil conservation, drought mitigation, access to water, land and other natural resources. 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 pump water? The interaction between land, water and energy is 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. This means taking into account issues such as soil health and degradation.

Surface and Groundwater Resources Management and Urbanisation

The world's water consumption rate is doubling every 20 years — twice as fast as the population growth rate. By 2025, water demand will exceed supply by 56%. Managing this precious and finite resource is a critical and urgent challenge. While there is theoretically enough fresh water on the planet to sustain the needs of its population, much of it is wasted, polluted and unsustainably managed. In addition, its uneven distribution means that while some parts of the planet have more than enough water, scarcity occurs elsewhere. In many areas, increasingly erratic rainfall is leading to repeating cycles of drought and flood.

Efficient and effective water management should be based on accurate assessment of the available water resources, which is a challenge in Eastern and Southern African regions given the poor spatial and temporal distribution of hydrometric and meteorological stations. There is need for effective planning, design, management and utilisation of both surface and groundwater resources through an improvement in our understanding of different components of the hydrological cycle and the spatial and temporal distribution of water now and in the future. However, limited hydrological data availability coupled with complex hydrologic and hydrogeological systems has made prediction, planning and management of surface and groundwater resources under different conditions including extreme events, and with a changing climate, a challenge in the Eastern and Southern African regions. The theme focuses on how best to utilise existing data, and how newer technologies, such as remote sensing, can improve assessment of both surface and groundwater including transboundary aquifers.

Urbanisation brings another dimension to surface and groundwater by not just changing the landscape but also the hydrology because of localised and non-localised pollution, drainage and flooding due to the peculiarities of the water supply and sanitation, urban and peri-urban agriculture in addition to the traditional economic activities such as industry. An assessment of this phenomenon and how it links with the wider surface and underground systems is critical. The urban landscape is rapidly



changing and will continue to change because of economic and political pressures. This means that old planning models can no longer suffice for the new realities. Research is needed to guide planning for new urban spaces.

The papers in this sub-theme therefore should focus on addressing issues on enhancing efficient and effective assessment (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 urbanisation on water resources using appropriate models. Such models should take into consideration the water cycle's response to climate change. Studies which interrogate how countries in the Southern and Eastern Africa can collect, manage and share data on surface and groundwater resources are also welcome.

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 recognizing the water cycle as a biophysical process is essential to achieving sustainable water management. Biodiversity within inland water ecosystems in Eastern and Southern Africa 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. The challenge remains to strike 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. There is also the challenge of understanding the linkages between the various water sources and uses, which implies recognizing the existence of, not just hydrological boundaries, but ecosystems boundaries both at the national and transboundary levels as well.

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 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.



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=19wnsymp>. 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 19th 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.

Elsevier 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 at:

<http://www.elsevier.com/journals/physics-and-chemistry-of-the-earth/1474-7065/guide-for-authors>

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



Special Sessions to be convened During Symposium 19

AfriAlliance Roadshow 1- Brokerage Event 3



During the 19th WaterNet/WARFSA/GWPSA Symposium, WaterNet, jointly with consortium partners will convene the First Roadshow Brokerage Event No. 3 of European Commission funded AfriAlliance project under the Framework of Horizon 2020. 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.

Due to impacts of climate change, water availability and food security are becoming key challenges as both are highly vulnerable to continuously changing climatic patterns. Agricultural yields will likely be severely affected over the next hundred years due to unprecedented rates of changes in climate system. In this context, where climate change impacts, water availability and food security are closely linked, monitoring water availability to ensure the production is at stake to tackle economic, human, environment and political challenges. Thus the focus theme of the event will be **“Monitoring of water availability in terms of quantity & quality for food security.”**

The aim of this brokerage event is to:

- Help SMEs find market opportunities
- Enhance localised networking various African countries.

The event targets students, researchers and innovators in various Universities, Research Institutions and Private Sector in Africa, to raise the awareness of local innovation and technology needs and transfer.

The brokerage event will be staged in one session in form of an exhibition scheduled on 01 November 2018 focusing on innovations in water and climate change in line with the theme. This event will help SMEs find technology development and access opportunities (potential collaborators); help them find market opportunities (customers for their solutions) and enhance localised networking opportunities in various African countries.

Those interested in attending the Brokerage Event, kindly register on <https://goo.gl/forms/3P9FxCfRwzDowAWK2>.

More information can be requested from waternet@waternetonline.org



Title: “Towards Sustainable Water Management in Mozambique”

Convened by:



Funded by:



Partners:



Session convened by IHE Delft Institute for Water Education (Janez Sušnik) and Universidade Eduardo Mondlane (Dinis Juizo)

Managing fragile water sources for urban and rural uses is an ever-growing challenge in a rapidly developing world where pressure on these resources is increasing dramatically. This challenge is particularly acute in many developing nations, and particularly in southern Africa. The situation has recently been brought into sharp focus through the predominantly urban water supply crises in Cape Town (South Africa) and in Maputo (Mozambique). Both cities instigated water rationing measures, with Maputo considering many options to reduce demand, improve supply efficiency, and boost supply totals. Moreover, small urban areas - the fastest growing urban areas - often rely on inadequate water supply and sanitation service provision and lack concrete strategies for improving public health. At the same time, water demand from the agricultural sector is continually growing but irrigation production was severely affected in the Limpopo and Incomati rivers due to the extremely low rainfall during the rainy seasons of 2016-2017 and 2017-2018. Quite often, rural stress tends to be under-reported, but is no less serious (e.g. the ongoing impacts to irrigation in the Limpopo and Incomati Rivers). Mozambique is facing all these challenges, resulting in considerable effort being put into how to sustainably manage its water resources to secure both urban and rural water services. Further local research into sustainable urban and rural water management is urgently required, as is improving the capacity of local water providers in order to deliver sustainable services.

This session aims to explore ongoing activities centred in Mozambique that explore actions towards sustainable water management from a number of angles. In this respect, the session showcases six diverse projects: 1) AltWater (www.altwater.un-ihe.org) which investigates the potential of alternative water supply solutions in urban areas; 2) SMALL (www.small.un-ihe.org) which aims at supporting the development of sustainable water and sanitation provision models for small towns; 3) SALINPROVE (www.salinprove.un-ihe.org) which explores issues surrounding saltwater intrusion in coastal aquifers; 4) A4Labs (www.a4labs.un-ihe.org) which co-develops, tests, and compares with farmers and partners methodologies to create reliable and sustainable sources of water using water from dry river beds; 5) FIPAG Training Academy which enhances staff capacity in addressing these issues locally; and 6) IWACA-TECH which aims for improved water efficiency and productivity control based on advanced remote sensing technologies, with a focus in large scale open canal irrigation systems. The session also aims to bring together academics and practitioners from around the region to share experiences and expertise surrounding sustainable water management in a challenging and rapidly changing environment.



Prediction of Hydrological Processes in Data Scarce Environments

Convened by the ZAMSECUR project on Enhancing, Water, Food and Energy Security in the Lower Zambezi



For water management, it remains a challenge to operate a water system within a data-scarce environment. Traditional observation networks are extremely hard to maintain operational and water users have their own way of securing access to water, often without the water manager being aware or having been informed. Fortunately there are technological developments that can be used to assist water managers to get a better hold on the state of the water system and to manage the water resources according to policy. Remote sensing products are becoming more and more useful for water managers in providing estimates for precipitation, evaporation, water storage, inundated areas and water levels. But these products are often still inaccurate or require local fine-tuning. Ground observations remain important to calibrate, interpret and improve these products and to make them useful for the demands of the water manager.

There are many new developments to observe hydrological processes at ground level. The use of drones for accurate observation of local topography, moisture states and vegetation characteristics, can be a breakthrough in groundtruthing and downscaling remote sensing products. Local observation of evaporation by Distributed Temperature Sensing (DTS) or by eddy covariance in different ecosystems may be crucial to improve evaporation products. And there may be many more technologies that have proven useful under temperate climate conditions, but have not yet been tested under semi-arid tropical conditions.

The Zambezi Basin is one such systems whose tributaries remain largely ungauged yet understanding of the hydrology and the management of water resources and infrastructure is crucial to the sustainable development and utilisation of the available water in the system. This session is meant to bring together hydrologists and water managers to explore the possibility of using these new tools in the Zambezi Basin and other similar catchments. We also welcome contributions by hydrological modellers, experimentalists, field workers and researchers working in data scarce environments.



Important Dates and Registration Fees

Deadlines

Deadline for submission of abstracts	30 April 2018
Notification acceptance of abstracts	15 May 2018
Deadline for early bird registration	31 May 2018

Registration fees

Early bird registration <i>Payable by 31 May 2018</i>	USD 400.00
Student registration	USD 300.00
Normal registration <i>Payable by 31 August 2018 (Proof of studentship to be provided)</i>	USD 420.00
Late registration <i>Payable after 31 August 2018</i>	USD 500.00
Exhibitors	USD 600.00
Special sessions <i>Payable by 31 August 2018</i>	USD 600.00

Payment details for International Participants

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

Kindly request for an invoice from symposium19@waternetonline.org; waternetonline@gmail.com or generate an individual invoice from <http://www.waternetonline.org/annual-symposium/registration>

Online Payments (MasterCard, Visa, PayPal): www.waternetonline.org/annual-symposium/registration



Payment details for local (Zambia) Participants

Zambian Kwacha Account

Bank Name: Barclays Bank of Zambia Plc
Account Name UNZA (School of Engineering)
Account Number: 1471461
Brach Code: 016
Branch Name: Lusaka Barclays Business Centre
Swift Code: BARCZMLX
Sort Code: 02-00-16

Payment details for local (Zambia) Participants

United States Dollar Account

Bank Name: Barclays Bank of Zambia Plc
Account Name: UNZA (School of Engineering)
Account Number: 10445561
Brach Code: 001
Branch Name: Head Office
Branch Code: BARCZMLX
Sort Code: 02-00-01

United States Dollar Account

Bank Name: Barclays Bank of Zambia Plc
Account Name UNZA (School of Engineering)
Account Number: 1471461
Brach Code: 016
Branch Name: Lusaka Barclays Business Centre
Swift Code: BARCZMLX
Sort Code: 02-00-16

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Registration

Online registration can be done on
<http://www.waternetonline.org/annual-symposium/registration>

For Further Information

Details on the Symposium will be uploaded and updated at the websites indicated as they become available.
<http://www.waternetonline.org/annual-symposium/>

For enquiries and requests for invitation letters, contact

symp19loc@unza.zm; symposium19@waternetonline.org or waternetonline@gmail.com

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 Zambia brief which can be found [here](#).

