



FIRST CALL FOR ABSTRACTS

25th

WaterNet/WARFSA/GWP-SA Symposium on

**Enhancing Sustainability: Upscaling Innovations and
best Practices for Integrated Catchment and Water
Resources Management (ICWRM) in Eastern and
Southern Africa – LEAVING NO ONE BEHIND**

Jointly convened with:

International Association of Hydrological Sciences (IAHS), Water Research Commission, AU/NEPAD Southern African Network of Water Centres of Excellence (AU/NEPAD SANWATCE) and the Local Organizing Committee led by the National University of Lesotho

With support from the Government of Lesotho

**A Blended Event to be held virtually and at the
Avani Maseru Hotel, Maseru, Lesotho**

**30th October to
1st November 2024**





Innovative Approaches, Practices and Technologies for Affordable Water Supply and Sanitation Services

Sustainable Development Goal (SDG 6) aims to “Ensure availability and sustainable management of water and sanitation for all by 2030”. Lack of adequate access to safe drinking water and basic sanitation is a global issue that is particularly severe in Africa, especially in Eastern and Southern Africa. Demand for safe drinking water and wastewater generation is rising quickly due to rapid urbanization, population increase, and economic development. Africa is urbanizing rapidly due to population growth – its population is expected to be up to 1.3 billion by 2050. Percentage of people who lack access to clean drinking water is estimated to be 40% in Sub-Saharan Africa including in the Eastern and Southern Africa. Regarding accessibility to improved sanitation, Africa lags behind other continents in access to safe drinking water and basic sanitation. Almost 70% of populations do without basic sanitation. Furthermore, inadequate access to water, sanitation and hygiene (WASH) services has many health consequences: it contributes to the burden of diarrheal diseases that cause child mortality globally. Due to limited access to clean water supply and sanitation in Sub-Saharan Africa, 842 000 adults and 120,000 children under five, die yearly from diarrhea 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 availability of water and on how well this precious resource is managed.

With regard to wastewater and wastewater treatment, the generation of wastewater is increasing rapidly, especially in the global south. It has been estimated that 80% of the wastewater generated globally, with 90% in the global south, is directly discharged into the environment without being treated or reused. Rapid population growth in Africa has resulted in a rise in water consumption, leading to increased wastewater generation and discharge. This phenomenon increases the demand for providing basic services, including wastewater management. Yet, treatment and disposal of this wastewater have not kept pace with this increased demand. Untreated wastewater pollutes surface and groundwater and may, therefore, lead to many diseases and illnesses, resulting in the deaths of the young, the elderly and vulnerable people. Africa treats only 1% of wastewater to secondary level. Given

BACKGROUND

The 25th WaterNet/WARFSA/GWP-SA Symposium will be held in Maseru, The Mountain Kingdom of Lesotho at Avani Maseru Hotel, 30th October – 1st November 2024 under the theme ***Enhancing Sustainability: Upscaling Innovations and Best Practices for Integrated Catchment And Water Resources Management (ICWRM) in Eastern and Southern Africa – Leaving No One Behind***. The 25th Symposium will be hosted by the National University of Lesotho in collaboration with other partners.

The Symposia have been held annually in the Eastern and Southern African regions for the past 24 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 has been placed on integration of knowledge, particularly involving scholars from the natural and social sciences.

This year's symposium sub-themes have been aligned to the achievement of Sustainable Development Goals (SDGs) and the SADC Water Research Agenda under the Regional Strategic Action Plan (RSAP) on Integrated Water Resources Development and Management Phase V, whose main objective 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 realization 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 (sub-themes) detailed below.



the urgency to accelerate the achievement of SDG target 6.3, which aims at *“decreasing the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”* by 2030, context-specific wastewater treatment systems are urgently needed considering waste water as a useful resource which can be recovered and used for productive purposes. In addition, solid waste is not collected systematically and disposed not using proper disposal methods, thereby, posing a health hazard to residents and the environment. New and innovative approaches are required in wastewater management to alleviate these challenges.

In order to achieve a number of sustainable development goals such as eradication of poverty 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), clean and affordable energy (goal 7), reducing inequality (goal 10) and sustainable cities and communities (goal 11), life below water (goal 14), life on land (goal 15), there is 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. The available innovative technologies include Internet of Things (IoT) and Self-Monitoring, Assessment and Reporting Technology (SMART), which can provide innovative solutions for real-time monitoring and controlling of system operations and management.

Abstracts 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

Water is at the core of sustainable development and is critical for socio-economic development, healthy ecosystems and human survival. It is vital for reducing the

global burden of disease and improving the health, welfare and productivity of populations. However, the world is currently bedeviled by a freshwater crisis which ranges from scarcity to plenty (due to flooding) during some years in Sub-Sahara Africa in general and eastern and southern Africa in particular. More than 1.7 billion people currently reside in river basins where depletion through use exceeds natural recharge, a trend that will see two-thirds of the world's population living in water-stressed countries by 2025. All this negatively impacts on socio-economic development, healthy ecosystems and human survival. Factors behind the global water crisis include changing climatic conditions, deforestation, over abstraction of groundwater resources, rapid population growth, pollution of freshwater resources and ineffective and inefficient water and natural resources governance approaches. The planet's endowment of water is expected to remain constant, human appropriation of water, already at 50% by some measures, is expected to increase further.

In the midst of the above challenges, good and appropriate water governance is seen as a panacea to the current global water challenges as this is a critical factor for adequate and sustained progress towards achieving Sustainable Development Goal (SDG) 6. Good water governance is enhanced by the adoption and implementation of particular approaches and frameworks. Countries in the Eastern and Southern Africa regions have mainly adopted integrated water resources management (IWRM) as a governance approach. However, there are other approaches which are gaining prominence in these regions, such as integrated catchment management (ICM) and the water-energy-food (WEF) nexus approach.

Integrated catchment management uses the catchment as an entry point in the holistic and complex management of natural resources and how human society relates to these. Countries like Lesotho have adopted ICM as the dominant management approach of natural resources. The water-energy-food (WEF) nexus has emerged as an increasingly prominent global policy,

governance and research agenda. Conceptually, the WEF nexus means that water security, energy security and food security are inextricably linked and, more importantly, actions in any one sector will impact in one or both of the others. The approach has been accepted at SADC level and individual countries within the region are in the process of operationalizing it.

This sub-theme invites abstracts that address the following:

- Appropriate water governance arrangements at different levels (regional, national, transboundary and local);
- The adoption of different water governance frameworks including their implementation and operationalization;
- The role of artificial intelligence and machine learning in water governance;
- Stakeholder participation in water governance at various scales;
- Legal and policy frameworks for water management as well as their efficiency; and
- Models used for the delivery of water services, as well as differentiated pricing, subsidization, and incentives, as well as the human right to water.

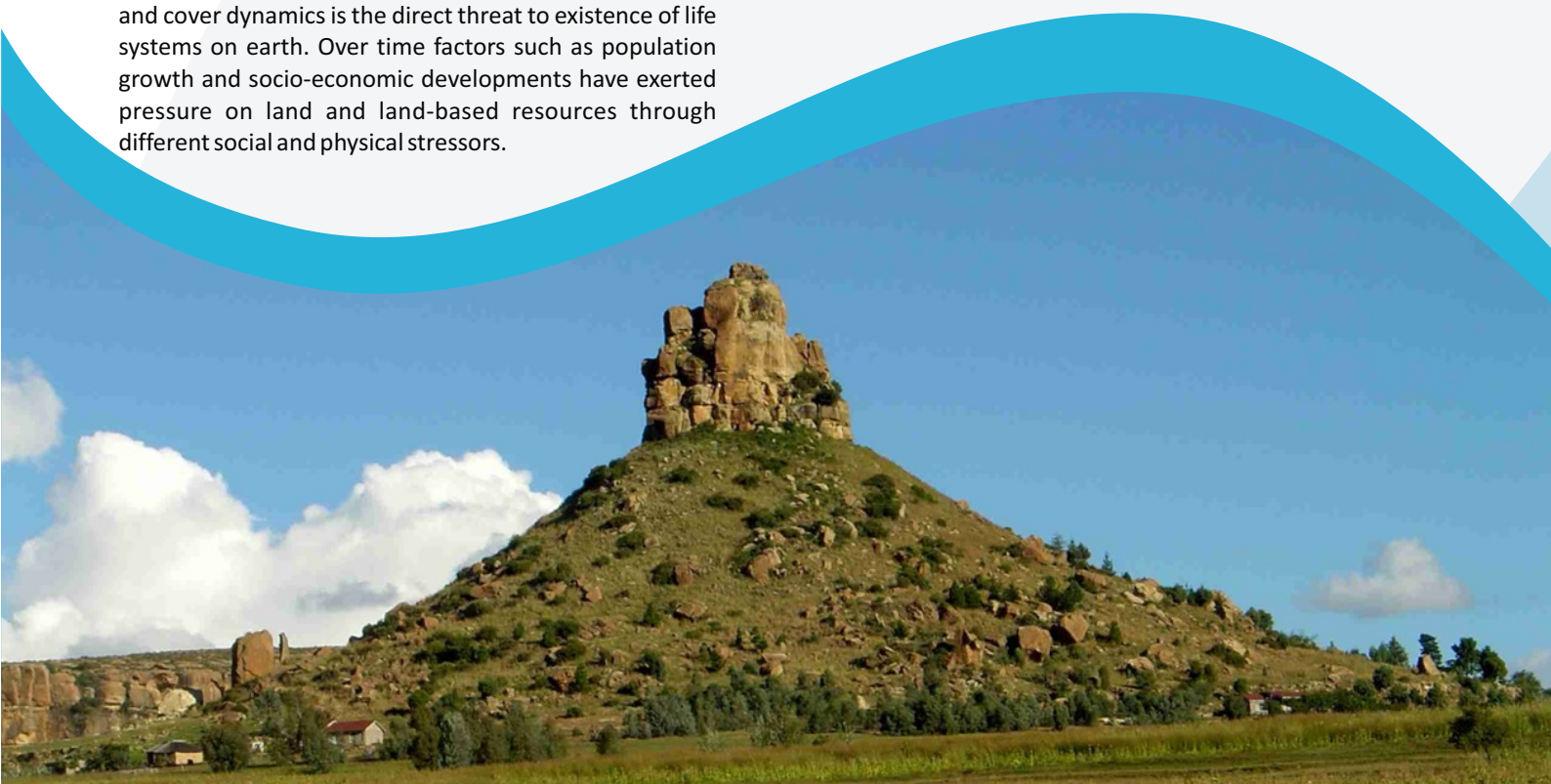
Water, Land, Energy and Agriculture Nexus

Land, which is defined as the terrestrial bio-productive system that comprises soil, biota, vegetation and other interwoven natural processes (ecological and hydrological) operating as a system, is the anchor of life systems. The land or soil is the bank of life, and the foundational life support system for plants, animals, and human beings, which renders it fundamental to life on the planet earth. Land resources support ecosystem function and services. It is upon the land where natural and socio-economic systems function together to support and sustain life. Thus, land degradation and any threats to the quality of land and land systems due to changing land use and cover dynamics is the direct threat to existence of life systems on earth. Over time factors such as population growth and socio-economic developments have exerted pressure on land and land-based resources through different social and physical stressors.

Agriculture consumes most of the freshwater resources in the world, while food production and distribution consume more than a quarter of the world's energy. Agriculture is a land-based industry by nature, and there is competition for available land to grow food and live on. Thus, water, energy, and land are critical resources for sustaining life and livelihoods. Population growth, rapid urbanization, dietary alterations, and economic development are all factors contributing to an increasing demand for water, energy, and land, all of which compete with agriculture. The links between these three resources form a nexus that requires research in order for it to be well understood.

Feeding a worldwide population of 9 billion people by 2050 will necessitate a 60% increase in food production. As a result, enhanced land tenure, management, development, and conservation are required to boost agricultural production, sustainable land use, and water resources. In most regions, meeting the need for agricultural goods while minimizing the demand for and conserving the quality of land and water is a serious challenge. Across the SADC region, the share of irrigated land as a fraction of total arable land is low. Agriculture's water and energy demands are expected to rise. Better techniques of accounting for and utilizing biophysical resources are necessary. However, the assessment is based on fundamental procedures that urgently require modification. The assessment of biophysical resources must involve the calculation of irrigation potential vs. arable land, the applicability of agricultural performance measures (water use efficiency, water productivity), and water usage by diverse land uses (such as forestry and biofuel feedstock).

Energy access is critical for poverty reduction and economic growth promotion. Agricultural development and the expansion of urban water systems both necessitate access to abundant, dependable, and affordable energy sources. Renewable energy applications have the ability to ameliorate many of the





difficulties that Africans confront on a daily basis, especially if done in a sustainable manner that respects human rights. However, in eastern and southern Africa, the usage of renewable energy for irrigation is still quite low.

The abstracts under this sub-theme should emphasize the interaction of land, water, and energy as an important nexus that must be fully defined, particularly the use of solar energy, rain-fed vs. irrigated agriculture production, water harvesting technologies, and other best practices to reduce pressure on the strained water resource systems. How can water, land, and energy be managed together in a way which considers the fact that there is less water than there used to be, that water is largely utilized for agriculture, and that water must be cleaned and pumped, which requires energy, including renewable energy? The sub-theme also entails the management of land and water to manage or reduce soil erosion.

Changing Hydro-Climate Regimes and Planning Tools for Climate Resilient Development Pathways

Climate change has caused significant shifts in hydro-climatic patterns worldwide, manifesting in the form of global increase in temperature, inconsistent rainfall and affecting hydrological processes. These changes have far-reaching consequences for water resources, agriculture, infrastructure, and overall development. The eastern and southern African regions, with limited adaptive capacity, reliance on the available natural resources, and underdeveloped agriculture, are particularly vulnerable.

To ensure sustainable future, it is crucial to understanding climate variability and change impact on hydrological regimes, surface and ground water resources, and adopts robust planning tools for climate-resilient development. Climate change is projected to have a substantial macroeconomic impact on Eastern and Southern African countries, potentially resulting in a 5-15% loss of GDP by

2050. Moreover, integrated catchment management (ICM) utilizes mechanisms such as natural flood management, sustainable drainage systems, land use planning, flood forecasting and warning systems, and community engagement, to address the threat of floods. Despite limited investigations, these approaches aim to reduce flood risk, enhance resilience, and promote sustainable development practices. Therefore, understanding the specific effects of climate change on water resources, employing innovative technologies such as remote sensing, machine learning and big data, and utilizing existing data are vital for assessing surface, groundwater, floods, and droughts, including transboundary water resources.

Integrating hydro-climate risk assessments into development planning is essential in building climate change resilience. These assessments should consider future climate scenarios and evaluate the vulnerability of infrastructure, communities, and ecosystems. By implementing climate adaptation strategies such as sustainable water management practices, climate-smart agriculture techniques, and resilient infrastructure design, societies can build resilience against changing hydro-climatic conditions.

This sub-theme invites abstracts which focus on:

- Understanding and addressing the challenges posed by changing hydro-climatic conditions;
- The impacts of climate change on hydrological processes including groundwater;
- Innovative and integrated water management and planning tools; and
- Implementation of adaptive strategies, good governance, and harnessing technology to navigate these challenges and create a sustainable and resilient future.

Water, Ecosystems and the Environment

The environment and specialist ecosystems such as forests, marshes, grasslands and wetlands are essential parts of the global water cycle. They not only act as water capture areas for aiding groundwater recharge,

but they also reduce the rates of land degradation while promoting the proliferation of water resources. The continuous health of ecosystems and the broader environment is therefore key for sustainable freshwater resources. Freshwater ecosystems are, however, facing challenges such as sedimentation, degraded water quality, channelization of rivers, removal of riparian vegetation, and the introduction of, and encroachment by exotic species. These are further exacerbated by climate change, urbanisation, the expansion and intensification of agriculture.

These challenges confronting the aquatic ecosystems and the environment call for interdisciplinary initiatives to deliver proven solutions. For sustainability, such solutions have to be supported by: technological innovation in securing and augmenting water resources; scientific innovation in understanding health and ecosystem impacts of contaminants that find their way into our waters; financial innovation in sustainably managing available water supplies and accounting for resource use; social innovation in bringing water and sanitation to those without them while also promoting proper use; and policy innovation to address threats such as climate change, population increase and land use change. Thus, it is necessary to engage every stakeholder in developing interdisciplinary and balanced approaches that deliver sustainable solutions.

The abstracts in this sub-theme should discuss:

- Innovative and best practices in environmental impact assessment;
- The value and potential of the ecosystem services approach for improved decision making with an emphasis on integrative catchment planning;
- Valuation of ecosystem goods and services;
- The tools available to assess ecosystem goods and services and how to select the best tools for different contexts;
- Engagement of stakeholders for input and feedback in ecosystem service assessment;
- Plant–water relations and influence on the water cycle and the ecosystems in general;


- Including ecosystem goods and services in the development of water resources;
- Integrated catchment management;
- Pollution prevention and treatment;
- Wise use of water-linked ecosystems and people's livelihoods; and
- Sustainable use of blue resources for economic development and other related topics.

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;



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- 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=25wnsymp>. 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 25th 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 will also request:

- 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; and
- 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) and Proceedings of International Association of Hydrological Sciences (PIAHS)

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

Authors will have also an opportunity to publish under the PIAHS (Proceedings of the International Association of Hydrological Sciences), a 6-page summary of the work presented during the Symposium. More details can be accessed at <https://www.proceedings-iahs.net/>

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

SPECIAL SESSIONS

All organizations 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 organizers 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.



Important Dates and Registration Fees

Deadlines

Deadline for submission of abstracts:	31 st May 2024, extended to 30th June 2024
Notification acceptance of abstracts:	15 th June 2024, extended to 10th July 2024
Deadline for early bird registration:	31st July 2024

Registration fees for physical attendance

Early Bird Registration for International Delegates	USD 380
Early Bird Registration for Lesotho Based Delegates	LSL 6,270
<i>Payable by 31 July 2024</i>	
Normal Registration for International Delegates	USD 430
Normal Registration for Lesotho Based Delegates	LSL 7,220
<i>Payable by 30 September 2024</i>	
Late Registration for International Delegates	USD 480
Late Registration for Lesotho Based Delegates	LSL 9,120
<i>Payable after 30 September 2024</i>	
Early Bird International Student Registration	USD 300
Early Bird Lesotho Based Student Registration	LSL 5,200
<i>(Proof of studentship to be provided)</i>	
<i>Payable by 31 July 2024</i>	
Normal Registration for International Student Delegates	USD 350
Normal Registration for Lesotho Based Student Delegates	LSL 6,000
<i>Payable after 30 September 2024</i>	

Registration fees for virtual participants

Early Bird Registration for International Delegates	USD 50
Early Bird Registration for Lesotho Based Delegates	LSL 950
<i>Payable by 31 July 2024</i>	
Normal Virtual Registration for International Delegates	USD 80
Normal Virtual Registration for Lesotho Based Delegates	LSL 1,360
<i>Payable after 31 July 2024</i>	
Late Virtual Registration for International Delegates	USD 100
Late Virtual Registration for Lesotho Based Delegates	LSL 1,900
<i>Payable by 30 September 2024</i>	

Exhibitions

International organizations/company	USD 800
Local organization/company	LSL 13,600
<i>Payable by 30 September 2024</i>	

Special Sessions

International organizations/company	USD 800
Local organization/company	LSL 13,600
<i>Payable by 30 September 2024</i>	

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
Reference to be used: Symposium, Initials, Surname (e.g. Symposium_J Kabila)

Payment Details for Local (Lesotho) Participants

Bank Name: Standard Lesotho Bank
Branch: City Branch
Branch Code: 060667
Account Name: National University of Lesotho
Account Number: 9080002587781
Currency: Maloti
Swift Code: SBICLSMX
Account Type: Current Account
Bank Postal Address: Kingsway, P.O. Box 115, Maseru, Lesotho
Reference to be used: Symposium, Initials, Surname (e.g. Symposium D. Kidawa)

Kindly generate an invoice [HERE](#)

Requests for Customised Invoices

- International participants request invoices on symposium@waternetonline.org
- Local participants request invoices on nulwi@nul.ls

Proof of payments

Please upload proof of payment [HERE](#)

It is VERY IMPORTANT to indicate delegate's name on Bank Transfers to facilitate processing of registration.

Registration

Online registration can be done [HERE](#)

For further information:

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

For requests for invitation letters, contact:

symposium@waternetonline.org or nulwi@nul.ls

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 Lesotho Brief which can be found [HERE](#).

