

## Welcome Note

As 2023 starts; it's a time to reflect on progress made towards goals and targets set for 2022 in general and Phase V in particular. WaterNet wishes to thank all members, partners, and stakeholders who contributed to the success of the network since the beginning of 2022. The WaterNet Management Board calls on all members to work together in order to ensure the success of Phase V which will run up to 2026.

### In this issue:

- ◆ Message from WaterNet Trust new Chairperson - Prof. Nnenesi Kgabi
- ◆ Message from the former WaterNet Trust Chairperson - Prof. Hodson Makurira
- ◆ 23<sup>rd</sup> WaterNet/WARFSA/GWP-SA Symposium
- ◆ International Summer School
- ◆ Short Professional Courses
- ◆ The Human Capacity Development Project in Integrated Catchment Management (ICM) for Lesotho
- ◆ WaterNet Alumni bids Farewell to Eng. Zvikomboro Hoko on his Retirement from Academia
- ◆ Congratulatory Messages



The 23<sup>rd</sup> WaterNet/WARFSA/GWP-SA Symposium was successfully held at the Sun City Resort, Rustenburg South Africa from 19<sup>th</sup> - 21<sup>st</sup> October 2022. The theme for the Symposium was “**Integrated Water Resources Management for Sustainable Development in Eastern and Southern Africa**”

The annual Symposia remains a platform for water professionals to share advances in research and education related to Integrated Water Resources Management in the Eastern and Southern African regions and beyond. Water professionals concerned with the wise use of water regard this as a key annual event. To date, 23 Symposia have been organized attracting an average 400 water professionals.

Symposium 23's programme, just like in other years consisted of scientific presentations highlighting the latest research achievements as well as more general conceptual papers and special sessions .

Symposium 23 was officially opened by Dr. Jennifer Molwantwa, Chief Executive Officer, Water Research Commission of South Africa

>>>>Page 4



Building capacity for Water Resources Management In Southern Africa

## Message from the WaterNet Trust Chairperson



The 23<sup>rd</sup> Annual WaterNet General Meeting, held online on the 10<sup>th</sup> November 2022, confirmed the election of Prof. Kgabi as the new WaterNet Trust Chairperson for the next four years, 2022 - 2026. She takes over from Prof. Hodson Makurira.

Prof. Kgabi currently serves the North-West University (NWU) as Director: Research Support. She is also an Extraordinary Professor in the Unit for Environmental Sciences and Management at the NWU; and Affiliated Professor in the Centre for Environmental Management at the University of the Free State (UFS).

Below is Prof. Kgabi's message to the members of the network.

### Fellow Members, partners and collaborators

'Thank you for participating in WaterNet programmes in 2022. It was a year I'm tempted to designate as "a year of transition" in the history of WaterNet. We started the year with the relocation of the WaterNet Secretariat from the University of Zimbabwe (where it had

been hosted for two decades) to the North-West University in South Africa'.

Prof. Kgabi applaud the WaterNet Secretariat for its commitment to a smooth transition and continuity of the organizational operations amid the hurdles encountered with regards to the granting of work visas/permits.

She thanked her predecessor - Prof. Hodson Makurira, whose term ended in November 2022. She said, Prof Makurira did an excellent job leading WaterNet through to the end of the WaterNet Phase IV Strategy, and the beginning of the WaterNet Phase V Strategy (2022 - 2026).

Prof. Kgabi said she is highly appreciative of the commitment to the success of the Network shown by the Board during 2022. 'Congratulations are in order for the current, re-elected and/or newly appointed Board members'.

'To our Partners and Collaborators. It is with great gratitude for your input and support that we can declare 2022 a success with regards to the successful implementation of all programmes/projects. Together we have created something bigger than the sum of what each individual can create on their own. Thank you!'

### Highlights for 2022

WaterNet seeks to build upon its strengths and evolve into a sustainable network playing a leading role in water capacity development in the SADC and East Africa region, and contributing directly to the global agenda of sustainable development. In 2022, the Network successfully implemented the programmes planned for the year, and achieved its goals. Thus, I will mention a few highlights namely, the WaterNet Symposium, Water-Climate Summer School, the Regional masters' programme, and the short professional training programme.

Water-Climate Summer School - The International Water-Climate Summer School organised by the North-West University in partnership with WaterNet and Bridging Africa, Latin America and Europe on Water and Renewable Energies Applications (BALEWARE) was held in Mahikeng, South Africa from 4 to 18 October 2022. The following countries were represented: Austria, Botswana, Cameroon, DRC, Germany, Namibia, Netherlands, South Africa, Tanzania, Zambia and Zimbabwe.

WaterNet Symposium - Congratulations to the North-West University (NWU), the local organising committee (LOC) and the WaterNet Secretariat for a successful symposium. The North-West University (NWU) played its part by being the primary host of the 23<sup>rd</sup> WaterNet WARFSA/GWP-SA Symposium that took place in Sun City, South Africa from 19 to 21 October 2022. We recorded participation of more than 280 physical attendees and around 210 online participations.

Regional Masters Programme - We also appreciate member institutions which continued to be at the forefront of offering the MIWRM during 2022. The success of the Masters programme is a demonstration of the good collaboration between the seven SADC universities, our international partners, and more than 70 WaterNet members, whose staff contribute to the teaching and curriculum development.

### Vision for the Network

My vision for the network is aligned to the theme of the WaterNet Phase V Strategy (2022 – 2026), which is, 'Strengthening human and institutional capacity for innovative, systemic and sustainable regional water solutions in a changing environment'.

Guided by a reflection on the previous strategies and periodic reviews, and the successes and challenges and/or limited success in actual implementation thereof, the Phase V Strategy seeks to address contemporary issues including global trends on digitization and reliance on virtual platforms, thus requiring adoption of new approaches to capacity development (including online interactions), engaged research and innovative solutions and improved income generation approaches in the sector. >>>Page 3

## Message from the WaterNet Trust Chairperson...Cont'd

The evident changes in the global and regional water sector due to the new challenges (including the pandemic and similar situations) coupled with the need to maintain consistent supply of water (sufficient quantity of quality) in the face of emerging pollutants and continued deterioration of the water treatment and supply systems also informed the strategic focus.

Thus, I “dream” of an agile, globally recognised Network, playing a leading role in the development and implementation of sustainable water (and to an extent climate) solutions in the SADC and beyond. I dream of a Network which is consistent in its communication, advocacy and capacity strengthening role for the membership. I am cognisant of the fact that dreams do not materialise without strategies, and strategies do not materialise without well-defined goals and priorities.

### **Priorities for the network**

As you might be aware, the goals set for the Phase V Strategy are as follows: 1. Utilising and expanding regional capacity for degree and non-degree education in IWRM, 2. Addressing key challenges and providing relevant solutions through a dedicated collaborative research agenda aiming for impact, 3. Becoming the “go-to” source of expertise and knowledge on IWRM in Southern and Eastern Africa, and 4. Increased ownership of WaterNet members and SADC member states in the running and operations of the WaterNet business.

Based on the strategic goals, my priorities will revolve around the following principles- Advocacy and Visibility, Effectiveness and Sustainability, and Impact and Quality.

### **Effectiveness and Sustainability**

**Participatory management** - The Secretariat will continue to render its services during Phase V but will consider the secondment of staff from member institutions and increased decentralisation of tasks in order to work towards financial sustainability. This will include requests for members to coordinate specific Network collaborative projects and report accordingly.

**Digital transformation** - There is also a great need to reimagine the Secretariat and Network operations and processes, culture and membership interaction and experiences to meet the changing networking and collaboration requirements in the digital age.

**Monitoring and reporting** - I also intend to work with the Board on the strengthening of the monitoring, reporting and accountability for all projects/programmes. Some of the improvements are to include reporting formats, frequency of reporting, critical reading, verification, and translation of reports to ensure dissemination and contribution to real life solutions.

### **Advocacy and Visibility**

**The Annual Symposia** - WaterNet will continue to work with international and regional organisations such as the IAHS, GWP, and other like-minded organisations in order to successfully co-convene the annual symposia during Phase V. However, we should not stop with the symposium because this a crucial moment for WaterNet to have a ‘seat at the Table’ whenever water related matters are being discussed and decisions made. We have not been audible and visible enough within the relevant communities of practice in the continent and on international platforms.

**WaterNet Alumni** - I strongly believe that today’s generation has an unquenchable thirst to address the socio-economic ills of the age, including water and climate challenges. Thus, a database of water experts (members in particular) with their skills should be developed in the course of Phase V, and the alumni role and/or scope revisited to leverage their influence, and maximise their engagement.

**Communication platforms** - We also need to improve our communication platforms e.g. our website to make it “eye-catching”, informative and interactive, and use more digital media platforms to showcase the members’ projects/programmes and achievements.

### **Impact and Quality**

The Vision of WaterNet carries an implied yet intelligent message of research impact - “... contributing to the equitable sharing and sustainable utilisation of water resources for poverty alleviation, economic development, human wellbeing and environmental security.” As a Network, we should work towards encouraging, evaluating, recognising and rewarding excellence shown in the form of quality conference papers, articles, and other research outputs with different kinds of impact including: awareness, attitudinal, economic, social, policy, cultural and health impacts.

Finally, I believe that, with the changing paradigms of higher education and scientific research which hold no space for silos, WaterNet needs to embrace and strengthen partnerships and adoption of multidisciplinary approaches for sustainable solutions in the water-climate space.

Let us take heed of the words of Ryunosuke Satoro - “Individually, we are one drop. Together, we are an ocean.”

## Message from the WaterNet Trust former Chairperson



Prof. Hodson Makurira has been the WaterNet Trust Chairperson since 2018. His tenure saw some notable achievements that were attained by the organisation through his leadership. A number of projects were successfully completed which include the short professional courses, funded by the British and Germany governments through the Germany Agency for International Cooperation (GIZ). Under this project, a total of 19 short courses were undertaken where over 500 participants were trained in various IWRM related areas. WaterNet also managed to work with IUCN under the BRIDGE IV programme in the Buzi, Pungwe and Save basin on environmental flows, The AfriAlliance, ZAMSECUR, DUPC project for online courses and the BRECCIA projects were also successfully completed.

New projects were secured at the end of Phase IV and have spilled into Phase V. These include the EU and Germany government funded project through GIZ on **Human Capacity Development for Lesotho in Integrated Catchment Management: A Focus on the Tertiary Sector and Short Professional Courses**, which started running in August 2021– December

2023. The UNESCO Regional Office for Southern Africa Groundwater Vulnerability Mapping started at the end of 2021 and was completed in July 2022. The Dutch Government has continued providing funding to WaterNet for various activities through DUPC.

‘There were fears that migrating from the traditional Masters programme model of delivery would dilute the regional nature of our programmes. However, for the first time, we have seen a Summer School organised for more than 40 young water professionals from the region and beyond and this ran at the North West University, 4 - 18 October 2023. The students blended and forged regional networks’.

Prof. Makurira highlighted that the network’s research profile has continued to impress as the Special Issue of the Journal of Physics and Chemistry of the Earth (JPCE) continues to highlight the network’s research prowess in various critical themes in water science. The challenge remains is that there should be an aspiration for more high impact research which is easily traceable to the SADC Research Agenda and at regional scale. He said that this is not a big challenge for us but will certainly open more doors for the WaterNet family at local and global scales. Other areas that the network should work to improve on, include Doctoral and Post-Doctoral training, expanding membership base and encouraging timely subscriptions from the membership.

Prof. Makurira thanked all the partners who are always available to offer support in different forms. These include DGIS, SADC, GWP-SA, NEPAD SANWATCE, International Association of Hydrological Sciences (IAHS), to name but a few.

He highlighted that ‘as we go forward, we should reflect with pride on the successes scored during the past four phases. We are pleased to note that our alumni are visible at high levels in the SADC and East African water sectors. We have exported a few more onto the global arena’. He urged the Secretariat to update the alumni database to confirm who is making waves and where. That would certainly give ample evidence of the long term impacts of the WaterNet programme at global scale from a Human Capital Development perspective.

One of the major challenges faced during Prof Makurira’s tenure as Chairperson of the WaterNet Board was related to the COVID 19 pandemic which required quick adjustments to the way that things are done. The pandemic affected the implementation of all programmes which were usually done on a face to face basis. WaterNet quickly adjusted to the situation by conducting most of the activities online. Activities such as the Regional Masters Programme in IWRM, adopted an online format. For the first time, the 21<sup>st</sup> WaterNet/WARFSA/GWPSA Symposium in 2020 was successfully convened online and this saw over 800 participants joining the event. The Secretariat activities also continued their work online. Overall, there were no major disruptions to the activities of the network. The pandemic actually revealed that there are other ways of conducting business which are equally effective.

Prof. Makurira thanked the network members for the tremendous support given to the Management Board particularly in the past four years when he chaired the Board. He said ‘I have really enjoyed every year of my serving the WaterNet family through the Management Board. My tenure has come to an end and I look forward to serving the family in different capacities just like my predecessors who are now retired brigadiers. Once a soldier always a soldier’.

## 23<sup>rd</sup> Symposium Opening Ceremony

The opening ceremony of the 23<sup>rd</sup> Symposium was attended by over 300 delegates both physically, at the venue and online who included participants to the symposium as well as invited guests from various government Ministries and organisations from South Africa.

The Vice Chancellor of the North-West University, Prof Linda du Plessis gave the welcoming remarks on behalf of her University. She welcomed all the participants to South Africa in general and Rustenburg, Sun City Resort in particular and to the **23<sup>rd</sup> WaterNet/WARFSA/GWP-SA** Symposium jointly organised by the North-West University (NWU), WaterNet, Global Water Partnership, Southern Africa, AU NEPAD SANWACTE and the International Association of Hydrological Sciences (IAHS).



The outgoing WaterNet Chairperson, Prof. Hodson Makurira hailed the physical meeting of the 23<sup>rd</sup> WaterNet/WARFSA/GWP-SA annual Symposium at Sun City for the after the global shutdown due to the outbreak of the COVID 19 pandemic which brought the global economy to a halt as from the late 2019 to 2021. He said the gathering is commendable as it allows us to share experiences in water science and guide each other to better lives of the communities that we live in through collaboration in research and shared advances in water science.

Prof Makurira highlighted that the 23<sup>rd</sup> annual symposium happens to be the first symposium in Phase V of the WaterNet Programme. He hailed the new host for the WaterNet Secretariat, the North West University under Phase V. 'Coincidentally, the North West University is our Host for this year's symposium and we can all agree that we are gathered at an excellent venue with perfect ambience for fertile scientific interactions'. He went on to highlight that 2022 has been viewed as a transition period from Phase IV to Phase V and migration from Harare to Mahikeng, the WaterNet Management Board is pleased to note that normal WaterNet business has continued to run smoothly. He thanked the NWU for steering this transition and also the outgoing host, the Department of Civil and Construction Engineering at the University of Zimbabwe for hosting the WaterNet Secretariat since the inception of WaterNet in 1999.



In her official opening address Dr. Jennifer Molwantwa commended WaterNet and its partners for successfully organizing the 23<sup>rd</sup> Symposium given the fact that for almost two years the world grappled with the COVID 19 pandemic which made it impossible for any gatherings of this nature to take place. The hosting of the 23<sup>rd</sup> Symposium in South Africa at the Sun City Resort is testimony to the fact that the world is adapting to the new normal and is going back to normalcy. She highlighted that academics, policy makers and development practitioners from about 40 countries across the world, have come together both physically and online to both learn, share skills and knowledge around integrated water resources management (IWRM). Dr Molwantwa said she hoped that the symposium will come up with resolutions and plans in order to ensure that we are able to improve the way things are done and to enhance IWRM. The theme encompasses the concept of not leaving anyone behind, a very important approach especially within the context of climate change where others can easily be left behind. Ms Molwantwa urged the participants to ensure that the issue of climate change forms part of the discussions during the symposium deliberations so as to enhance planning, modelling, development programmes and decision-making currently and in the future. She highlighted that it is important for the region to ensure that there are sound mechanisms in place for disaster risk reduction as scientific evidence has already shown that there will be a recurrence of floods and droughts in the southern and eastern African regions. Dr Moltwantwa urged the symposium participants to promote the participation of the youth in the symposium as this forms part of building of experts for the future.

## 23<sup>rd</sup> Symposium Opening Ceremony



The key note address for the 23<sup>rd</sup> WaterNet/WARFSA/GWPSA Symposium was delivered by Prof. Tafadzwanashe Mabhaudhi who is a Researcher with the International Water Management Institute in Pretoria, South Africa. His talk was entitled **Achieving sustainable development under climate change: transformative futures for a water secure world.**

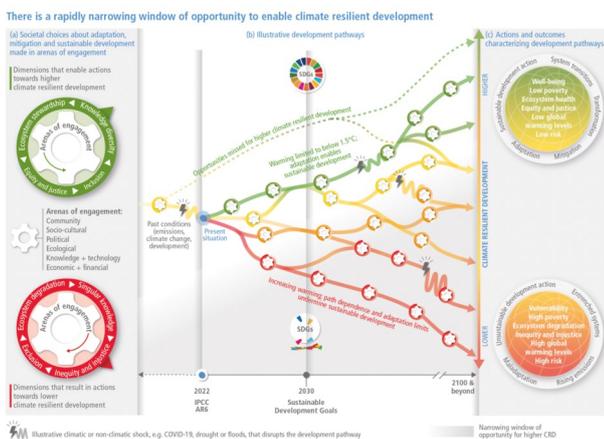
- Relevance of context
  - Sustainable socio-economic development, natural resources management, job and wealth creation
- Creating an enabling environment
  - Coherent and well-coordinated policies that are aligned to the context
- Robust governance
  - Technical and institutional capacity to bridge the implementation gaps
- Multi-scale and regionally differentiated solutions
  - From the farmer > village > watershed > local national > sub-regional > continental levels
- Mobilising resources
  - Access to climate finance is key to enabling African countries to adapt to and mitigate climate change
- Understanding trade-offs
  - Across systems, scales (temporal and spatial), objectives and priorities
- Capacity building
  - We need investments in capacity building

In order for transformation to be effective, there is a need for different stakeholders to be involved in these process and these include:

- The youth
- Policy makers
- Business
- Communities
- Farmers
- Conservationists
- Investors
- Sectors beyond water

There is however a need for the following to be done:

- Water research and innovation has to be focused on the right things to support future water security
- What are science and knowledge users' major needs for the future



Prof Mabhaudhi showed that the greatest impacts of climate change will be felt through water, with linked impacts on food and health. Water demand for both domestic and productive purposes increase while water quality deteriorates. Climate change is basically increasing water insecurity. Water-related risks such as drought and floods are also projected to increase as a result of global warming. This leads to a vicious cycle of poverty and inequality as well as violent conflicts as communities fight for scarce natural resources.

As shown on the diagram below, the world does not have much time to build the necessary climate resilience

## 23<sup>rd</sup> Symposium Scientific Plenary Session

The Scientific plenary was held on the 20<sup>th</sup> October 2022 under the theme: **The role in innovative technologies and approaches for sustainable water resources management by school children.** School children from four distinctive schools namely; Mogwase Technical School, Tswaidi Secondary School, Itumeleng Secondary School and Holy Family Secondary School attended the session and their representatives made their presentations on behalf of their schools.

Dr Jenifer Molwantwa, the CEO of the WRC delivered the opening remarks for the session. She highlighted that South Africa is one of the countries which is water scarce as the rainfall received in the country is below the world's average. This makes it important for everyone in the country to play a role in the management of the freshwater resources.

The first speaker, Olerato Phiri from Mogwase Technical School spoke on: **The importance of water in our lives and how young people can assist with water management and creating awareness of water usage in schools.** She highlighted that the youths need to get involved and engaged in development issues in general and water management issues in particular as its availability and scarcity also affect them. It is those youths with better knowledge on water resources who have a responsibility to educate others of the water scarcity and how they can all play a role in the management thereof. Olerato further highlighted that they already have strategies in their schools for promoting water conservation. For example, learners are engaged to carry water bottles, secondly turning off the water taps after washing hands and lastly reporting any water leakages seen around". Though these things may seem small but collectively, they are significant.



The second presentation was on: **Water resources management, strategy and misuse in the country** by Tsimela Vanessa from Tswaidi Secondary School. She highlighted that "with the population growing, the demand for water increases exponentially, meanwhile people still tend to use water recklessly". She further alluded to the fact that freshwater resources are being polluted more as a result of productive and domestic activities being carried out. There is thus, a need for educating everyone on proper water resources management. New approaches that guarantee access to clean water such as proper waste water recycling are important. She concluded by saying today's youth need to hold each other's hands, stand together and help each other educate one another on how to solve the water scarcity problem. 'Let us learn how to use water wisely and think for other people's needs and not our own only.'



The third presentation was on: **Water usage and addressing water pollution** done by Onalerona Maso from Itumeleng Secondary School. She highlighted that water pollution is a very serious environmental issue, that is mainly caused by humans. The best way to solve water issues is to **a)** set a water action plan, **b)** engage with everyone, **c)** repair water leaks **d)** give people a reason to save water **e)** seek allies **f)** practice what you preach **g)** encourage others to challenge themselves and **h)** Create awareness of importance of water by creating colorful posters on water use and saving. The real question is, are you saving water? Start first by the person in the mirror, which is you. Save that water for the future generation.

The final presentation of the session was on: **The mismanagement of water and how to resolve it in South Africa** presented by a pupil from Holy Family Secondary School. It is our responsibility to preserve water because without water there is no life. Lack of water has a negative impact in our lives, from domestic, hospitals to industrial use'. She went further to highlight that good water management entails the control and allocation of water resource to minimize damage to life and property and to maximize efficient use. Good management is when people play their part by ensuring that we make use of our resources in several ways. She ended her presentation by alluding that, governments need to train youths academically about water engineering and hydrology as such trainings enhances knowledge and acquisition of skills that can help the country in enhancing freshwater water management.



## 23<sup>rd</sup> Symposium: Summary of Sessions

The symposium had a total of 31 planned sessions, of which 3 were plenaries, 16 thematic sessions and 12 special sessions.

Plenaries included the opening, scientific and closing Special sessions, the following special sessions were convened by various institutions:

- **Innovation and appropriate technologies for sustainable Wash services for reaching Impacts and scale: Leaving no one behind:** Convened by the [World Vision](#)
- **Water-Energy-Food (WEF) nexus: from theory to practice:** Convened by [UKZN & IHE-Delft](#)
- **Water Security for Southern Africa (WASA) Program development workshop:** Convened by [BMBF/PTKA, GIZ, SANWATCE](#)
- **Reflecting on the SADC region shared watercourses governance and management issues, challenges and opportunities over the last two decades:** Convened by [OKACOM, ORASECOM, LIMCOM, BUPUSA, ZAMCOM](#)
- **The SADC Water Research Agenda-A Time for Reflection:** Convened by [NEPAD SANWATCE](#)
- **WEF Nexus session on Investment planning:** Convened by [Global Water Partnership Southern Africa](#)
- **Advancing the regional water security scientific agenda through inter/multi/Transdisciplinary research in SASSCAL countries:** [SASSCAL, NUST, ICWGC](#)
- **Restoration and protection of water systems for nature and people:** Convened by [WWF Zambia](#)
- **Data and Decision-making in Transboundary Waters:** Convened by [GWP-IUCN-OSU](#)
- **ReNOKA-Restoring land and water together in the mountain water tower: Ecosystems services and their continued provision fortify livelihoods support and natural resources conservation:** Convened by [ICU, Ministry of Water, Government of Lesotho](#)
- **The use of technology and Innovation to Improve Water Supply service Delivery Case Studies from Southern and Eastern Africa and Argentina:** Convened by the [Water Research Commission of South Africa](#)
- **Water Data Repository Southern Africa:** Convened by [WaterRes, CSIR, AUDA-NEPAD](#)

### Summary of Emerging Issues by oral theme

#### Water, Land, Energy and Agriculture

- Soil erosion is a global challenge affecting water quality
- Land use activities, e.g. urban, agricultural & industrial are negatively affecting catchments
- Land reforms can be an important climate change adaptation strategy
- Water accounting plus (WA+) can inform the decision in the data scarce catchments
- Stakeholder participation and capacity building are vital for water resources management

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

- Climate change & land use and land cover have effects on water resources
- Limited methods of investigating surface – groundwater interactions in sub-Saharan Africa
- Need for the development of cost effective methods for river flow measuring through the open source and free software to estimate discharge (video recording (pyopenrivercam))
- Cross sectional thinking and planning in dealing with water defining it as a whole ecosystem.

#### Water, Ecosystems and the Environment

- Current status of the world’s issues are biodiversity loss, climate change and population growth
- Water quality is deteriorating due to contamination
- Scarcity of water quality data for groundwater
- Dumping sites and mining effluents are sources of radionuclides and heavy metal pollution
- Proper innovative and Smart solutions have to be developed - Climate-Smart Agricultural practices

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

- The use of technologies such as artificial intelligence, machine learning, internet of things can be used in water quality assessment, water anomalies etc.
- Need for an integral approach in managing waste
- Besides looking at the water quality or disposal sites, there is need to educate the community and reduce waste and pollution from source
- Rural areas are being left behind in most initiatives

#### Water Governance and the Human Right to Water

- Early floods warning systems can be vital to communities if sent on time and the use of indigenous knowledge to convey the message
- Stakeholders should be involved in climate change discussions/ research
- City Blue Print performance frame work is a useful tool which can be used to assess the water management in different cities of the world.
- Transboundary agreements should always be made between sharing countries before any action can be made.

Theme	Planned	Actual
Changing hydro-climatic regimes and planning tools for climate resilient pathways	23	20
Water, Land , Energy and Agriculture	18	16
Innovative approaches, practices and technologies for affordable water supply, and sanitation services	25	33
Water, Ecosystems and the Environment	23	14
Water Governance and the Human Right to Water	15	15
Scientific Plenary	12	12

## Young Scientists Winners of Various Categories

Theme	Winner	Picture	Title of Paper
Water Governance and the Human Right to Water	<b>Lesego Gaegane</b> (Water Research Commission)		Sustainable dam siltation management, a pragmatic approach to enhancing water security
Water, Ecosystems and the Environment	<b>Abongile Xaza</b> (University of the Western Cape)		Application of integrated geochemical approach to evaluate hydrogeochemical processes influencing groundwater quality, Western Cape, South Africa
Water, Land, Energy and Agriculture	<b>Faraji Nyudike</b> (University of Dar es Salaam)		Assessment of Surface Water Availability Under Different Development and Management Scenarios in Kagera Basin, Tanzania
Changing hydro-climatic regimes and planning tools for climate resilient pathways	<b>Naima A.M. Hersi</b> (University of Dar es Salaam)		Groundwater recharge estimation for the Internal Drainage Basin, Tanzania under changing climate
Innovative approaches, practices and technologies for affordable water supply, and sanitation services	<b>Delight Bhumhira</b> (University of Zimbabwe)		Investigating the feasibility of communal container - Case of Magunje Growth Point
Best Poster	<b>Annah Aphia Umunezero</b> (University of the Western Cape)		Application of the multi-method approach to assess river-aquifer interaction in Heuningnes catchment, Western Cape, South Africa

## Lewis Jonker Award for the Best Presentation by a Young Water Scientist



The winner of the 2022 Lewis Jonker Award for the Best Presentation by a Young Scientist at the 23<sup>rd</sup> Symposium is Lesego Gaegane, a Senior Project Manager with the Water Research Commission of South Africa.

The following is the abstract for the presentation by Lesego Gaegane

**Title of presentation:** Sustainable dam siltation management, a pragmatic approach to enhancing water security.

South Africa is experiencing the harsh effects of climate change, with some impacts manifesting in extreme weather events impacting both water availability and quality. A decline in the number of rainfall days in the last 5 years is masked by rainfall intensity fluctuations. Unpredictable rainfall, soil erosion, and floods have exacerbated dam siltation. South Africa is heavily reliant on water stored in dams for its supply and provision. Siltation is trans-

ported by rivers into dams. As silt builds up in dams, it is trapped in reservoirs, and it interrupts the continuity of sediment transport through rivers, resulting in loss of reservoir storage and reduced usable life. This deprives downstream reaches of sediments essential for channel form and aquatic habitats. Dam construction kills vegetation, alters sedimentation patterns, disturbs aquatic life, increases deforestation, leads to ecological disproportion, and progresses siltation which leads to ecosystem degradation. With the acceleration of new dams construction globally, these impacts are increasingly widespread. There needs to be consideration of the adverse effects of industrialization and development on the environment. A pragmatic holistic approach to mitigating and managing the effects of siltation in dams and catchment areas, that is accompanied by a policy, is imperative.

Lesego Gaegane had the following to say about her research work and the award that she won:

‘This research study develops a national strategy to improve siltation management and increase dam storage capacity for increased water security. The research treats the dam, river, and catchment area as a linked ecosystem and this integrated approach, enables the rehabilitation of catchments and healthy water ecosystems. The methodologies applied consisted of numerical modeling, data analysis and interpretation, case study evaluation, cost-benefit analysis, stakeholder engagement through workshops, and piloting of tested methodologies. Through these methodologies, a suite of solutions in the form of mitigating measures was developed, which will generate new knowledge needed to make suitable, site-specific decisions regarding each dam on siltation management that can ultimately inform policy. Furthermore, a dam classification tool, dam operations model, and refined financial models to be used in dam infrastructure and ecological projects were developed. These findings provide tools that will enable a systematic approach to managing water resources sustainably for effective decision-making and the design of new dams .

As a woman in the STEM sector, I’m proud and excited to have won the award and to be in the company of great professionals who have won and gone on to work on impactful research and achieve greatness. I hope that this will also elevate the importance of siltation management in contributing towards water security and that through my award I have inspired other young water professionals. Having won the award means a lot to me, and that my passion for sustainability came through in my presentation and stood out’.

## WaterNet Sponsored Students for the 23<sup>rd</sup> Symposium

WaterNet supported students from the University of Dar es Salaam, University of Zambia and University of Zimbabwe to attend the 23<sup>rd</sup> WaterNet/WARFSA/GWPSA Symposium in Sun City, Rustenburg, South Africa. A total of 15 (5 from each university) students were supported to attend the event where they were able to present their research projects as well as to assist in the reappor- tioning of the symposium sessions.

The following summarizes participation by students from the University of Zimbabwe:

### More-Grace Hungwe



**THEME:** Changing hydro- climatic regimes and planning tools for climate resilient develop- ment pathways

**TITLE:** Tropical cyclone pre- diction, and detection: A remote sensing-based approach in flood- prone areas of Zimbabwe.

**SUMMARY:** It is critical to track TCs in the Indian Ocean

using satellite data and to develop a forecasting model that can be used to predict future TCs. This data can then be used to provide timely information to vulnerable communities in Zimbabwe.

### Zivai Pswarayi



**THEME:** Innovative ap- proaches, practices and tech- nologies for affordable water supply, and sanitation services

**TITLE:** Assessment of the impacts of household storage tanks on drinking water quali- ty. A case of Marondera, Zim-

babwe

**SUMMARY:** Intermittent water supply has become a norm in developing countries and residents have come up with coping mechanisms through the use of household storage tanks. This research aims to model the water quality in stor- age tanks through the period of storage and develop a math- ematical model that will be used to predict water quality changes.

### Valentine Tawedzera



**THEME:** Innovative approaches, practices and technologies for afford- able water supply, and sanitation services

**TITLE:** A decentralized wastewater planning study for settlements in Hwange Urban: A case of Hwange Colliery and Empumalanga settle- ments.

**SUMMARY:** Settlements in Hwange have poor sanitation facilities with open defecation still being practiced. This study seeks to design a decen- tralized wastewater system for settlements in Hwange.

tralized wastewater system for settlements in Hwange.

### Delight Bhumhira



**THEME:** Innovative ap- proaches, practices and tech- nologies for affordable water supply, and sanitation ser- vices

**TITLE:** "Investigating the feasibility and demand of a communal container :Case of Magunje Growth point.

**SUMMARY:** The topic looked into water pollution issues at local level especial- ly rural areas where technol- ogy and development is still behind. The waste mostly generated ends up in water and there is need to have solid waste management

practices introduced in rural homes and having to understand a community's perspectives, attitudes and current practices is key in then proposing a solution to the water pollution prob- lem.

### Emmanuel Hweru



**THEME:** Innovative ap- proaches, practices and tech- nologies for affordable water supply, and sanitation services

**TITLE:** Improving the quality of abattoir Effluent using nature based tertiary treatment methods: A case of Binder Abattoir, Goromonzi RDC

**SUMMARY:** Abattoir Effluent is known to contain very high organic load and difficulty to treat. A batch reactor consisting of vetiver plant, gravel, river sand and iron ore reactive media was monitored for 21 days under controlled conditions. Samples were collected at 7 day intervals and it was reported that BOD, COD, TSS, TN, TP, EC & TDS were removed up to 88 to 98%. The vertical flow constructer wetland developed proved to be efficient in the treatment of abattoir Effluent

Overall, the Symposium was well organized and the students gained a lot from the experience. The opportunity to compete in the Young Scientists competition also gave them exposure, confidence and valuable feedback for their projects which they can implement moving forward. We were very ecstatic that one of our participants was able to scope the Young Scientist Award for her sub-theme.

## WaterNet Sponsored Students for the 23<sup>rd</sup> Symposium...Cont'd

The five students from the University of Zambia who were sponsored to attend the symposium was composed of two PhDs and three MSc students. These students noted that the 23<sup>rd</sup> Symposium was well organised and sponsors were well interactive. The symposium proved that there is more that needs to be done within the realm of climate change and water. It was an opportunity to learn about various water challenges and opportunities for further research in different countries. Knowledge sharing was good. We recommend that such occasions can be continuously organised by various stakeholders to find solutions to water challenges and climate change.

### Geoffrey Mwanashiku (MSc Student)

Water governance for sustainable equitable and affordable water services



**Title:** Development of a decision support tool to establish suitability of groundwater drilling zones in Lusaka, Zambia.

**Summary:** The research is **Theme** aimed at developing a decision support tool that will help to define the most suitable sites for the drilling of new boreholes, especially in areas where water resources are scarce or under environmental pressure.

### Musyani Siame (PhD. Student)



**Theme:** changing hydro-climatic regimes and planning tools for climate resilient pathways.

**Title:** Exploring infrastructural adaptive capacity of water utilities to the effects of climate change; case study of the Upper Zambezi River Basin.

**Summary:** The basin is very vulnerable to climate change and prone to droughts. It is anticipated to experience lower levels of rainfall, lower levels of water availability and higher temperature. This will impede negatively on water supply infrastructure. So, the question is how can the water utilities respond against such effects in the near future and how effective are the response mechanisms being put in place to eval-

ability and higher temperature. This will impede negatively on water supply infrastructure. So, the question is how can the water utilities respond against such effects in the near future and how effective are the response mechanisms being put in place to eval-

### Michael Phiri (PhD. Student)



**Theme:** Water, Land, Energy and Agriculture

**Title:** The potential of Water Accounting Plus (WA+) in data-based decision making at sub-catchment scale: a case study in the Lunsemfwa Catchment, Zambia

**Summary:** He highlighted that whilst there was increasing competition and demand for water, there was no systematic study of the status and trends of water supply, demand, accessibility and use within the Lunsemfwa

Catchment. He proposed the use of the WA+, which is a remote sensing-based framework that provides spatial data on water

### Chisanga Lyoba

**Theme:** Water, Land, Energy and Agriculture

**Title:** Land use change and its drivers on the Bangweulu Wetland



**Summary:** Wetlands globally are depleting and this is due to the unsustainable land use activities being carried out by humans, an assessment of how the land is being used and the effects of these activities on the wetland to help know the state of the Bangweulu Wetland is the main aim of this study.

**Theme:** changing hydro-climatic regimes and planning tools for climate resilient pathways.

**Title:** Forest-Water Nexus: An Evapotranspiration assessment of the Kafue River Sub-Basin using Remote Sensing

**Summary:** This study highlighted that, there certain forest plant species that have a high capacity to pump

groundwater water and displace it into the atmosphere and cause water scarcity in one location. This is still an on-going study that will use remote sensing techniques to assess evapotranspiration and identify forest types with a significant evapotranspiration rate in the upper Kafue river sub-basin.

### Observation by students from Zambia on Young Scientists Awards

'The Young scientist Awards exposed us to the real world of research competition. It is a fact that research funders are looking for competitive research proposals and such an event offers knowledge and skills on how to prepare and package competitive research presentations for various audiences and objectives. It was also an exposure at regional level to compete with the best researchers in the field. Despite not winning the young scientist award, we intend to strive hard and bring it to Zambia in the next symposium'.



## International Water-Climate Summer School

WaterNet in partnership with the North-West University and Bridging Africa, Latin America and Europe on Water and Renewable Energy Application (BALEWARE) organized a International Water-Climate Summer School which focused on **Ethics and Intersectionality of Water- Climate Studies** at the Mahikeng campus, 4 - 18 October 2022. The summer school was hybrid, interactive, transdisciplinary summer school aimed to strengthen capacity for transdisciplinary water-climate research and to achieve the Sustainable Development Goal 6 (SDG6) – “Ensure access to water and sanitation for all”, and SDG13 – Climate Action. The programme included interactive lectures, engagement of the participants in a theatre performance for outreach to local communities, practical sessions, fieldwork/excursions, a science slam competition, poster session, three-minute thesis competition, and an award ceremony.

More than 40 Masters and PhD students, post-doctoral fellows and emerging researchers in water-climate fields of study/research attended the summer school physically and online. WaterNet funded a total of 20 students from the University of Dar es Salaam, University of Kinshasa, University of Zambia and University of Zimbabwe. There were 5 students from each of these universities. Under Phase V, WaterNet has now moved away from the concept of full scholarships for the Regional Masters Programme in IWRM as more network members are now offering the programme on a self paying basis. In order to strengthen the regional nature of the programme, summer schools for the students undertaking the programmes are being organized starting 2022.

Topics covered included:

- (1) Ethics and intersectionality for water-climate studies,
- (2) Integrated water resources management,
- (3) Groundwater and climate adaptation,
- (4) Water-climate monitoring tools,
- (5) Water-Energy-Food nexus,
- (6) Research Proposal Writing,
- (7) Thesis write-up & Writing for publication,
- (8) Theatre for Development: Raising awareness on SDG6 & 13.



## Reflections on the International Summer School by Students from the University of Dar es Salaam, Tanzania

The five students from the University of Dar es Salaam who attended the summer school are Leonard Ichard Maketa, Debora Bonan-tura, Gift Raphael Mollel, Faraji Godfrey Nyudike (all MSc students) and Naima Abdi Hersi (PhD student).

### INDOOR ACTIVITIES

The summer school indoor sessions and lectures included knowledge and skills that improved student's understanding of SDGs 6 & 13 and set them up for water research. Some of the topics covered include climate modeling, IWRM, water governance and ethics.

### OUTDOOR ACTIVITIES

The outdoor activities were fantastic and educational. Two research study visits to Molemane Eye and Groot Mocico Nature Reserves were undertaken by the students over two weekends. Students learned about river systems, soil and water sampling and how reserves support the preservation of nature, especially trees and water. The students also discovered that the waters around Molemane Eye are among the cleanest in the world.



### STUDENTS' ACHIEVEMENTS AND AWARDS



#### The three minute Thesis Competition, 3MT

Two students from UDSM won in this competition. Gift Mollel took the 1<sup>st</sup> position in the Masters' students category while Naima Hersi was also the 1<sup>st</sup> in the PhD students' category.

#### Science slam (5-minutes pitch) competition

The participants were supposed to present in a creative way, low-cost solutions to water climate adaption problems in five minutes only. Faraj Nyudike emerged as the overall winner of the competition with the title 'Let them Poo in Style'



### LESSONS LEARNED

It is with no doubt that by just being around a mixture of people from different countries with unique cultures (Tanzania, Zambia, Zimbabwe, Cameroon, Congo-DRC and South Africa) it was beyond imagination how much one can absorb and give out in the 14 days when engaging on the day to day activities of the summer school.

These were fruitful 14 days that we came to understand that regardless of the spatial variability of the African countries water and climate adaptation challenges are similar. This calls for joint actions in their tackling and through the summer school indoor and outdoor sessions, provided a platform through which a movement towards brainstorming and designing ways forward out of these challenges can be initiated.

Furthermore, the inclusion of many of the brilliant minds of the region in the team giving lectures was one of the most important achievements for the students to understand issues related to water-climate intersectionality.



## Réflexions sur l'International Summer School par des étudiants de l'Université de Kinshasa

### Contexte et Justification

L'eau est une ressource naturelle indispensable à tout être vivant. L'Afrique a aussi un potentiel important en ressource en eau il renferme pratiquement 12 Bassins Hydrographiques dont le Nil, le Senegal, Niger, Volta, Lake Tchad, Congo, Rufiji, Ganane, Zambezi, Okavango, Limpopo, et Orange. L'Afrique a le deuxième bassin le plus important en débit de 41 000 m<sup>3</sup>/s celui de Congo qui vient après le Bassin de l'amazone dont le débit est de 209 000 m<sup>3</sup>/s.

Malgré l'abondance cette ressource est vulnérable et devient de plus en plus rare ; la nécessité une attention particulière pour une gestion durable par la Gestion Intégrée de Ressource en Eau (GIRE) et par les Technologies (Système d'Information Géographique, SIG). Le besoin important de formation et de renforcement de capacité de personnel Africain et aussi les partages d'expériences et de technologies entre les pays de l'Afrique pour la gestion durable et les prévisions de cette ressource. Dans cette optique que Communauté de Développement d'Afrique Australe (SADC) par Waternet son institution subsidiaire qu'elle renforce les capacités de pays ce pays membre dont la République Démocratique du Congo (RDC) fait partie.

Waternet a son siège est à Mahikeng Campus dans la province du Nord-Ouest en Afrique du Sud et il est dirigé par le Manager Exécutif en la personne du Professeur Jean-Marie Kileshye. Par sa vision la région de la Communauté de développement de l'Afrique australe (SADC) et de la Communauté de l'Afrique de l'Est (EAC) a la capacité institutionnelle et humaine d'éduquer et de former ses propres gestionnaires de l'eau, capable de contribuer au partage équitable et à l'utilisation durable des ressources en eau pour la réduction de la pauvreté, le développement économique (sécurité des moyens de subsistance) et la sécurité environnementale.

Dans le cadre renforcement des capacités qui permettra aux peuples d'Afrique de gérer leurs ressources en eau de manière plus efficace, équitable et durable que à l'Ecole d'Été Internationale sur l'Eau et le Climat la session de 2022 a été organisé pendant deux semaine en période allant de 03 Octobre au 18 Octobre 2022 Nord-Ouest Université en Afrique du Sud sur le thème : Renforcement des capacités de recherche Transdisciplinaire sur l'eau et le climat.

L'Ecole Supérieure de l'Eau (ESE) de l'Université de Kinshasa a participé par 5 de boursiers de WaterNet 2 hommes et 3 femmes en l'occurrence messieurs Fiston Kayembe et Michael Nzali, et nos dames Cynthia Safi, Marinette Mwinja et Nana Kabujenda.

### Activités

Le programme comprend de conférences interactives, présentation théâtrale pour sensibiliser les communautés locales, des sessions pratiques, des travaux de terrain/Excursions, un concours de thèse en trois minutes et une cérémonie de clôture avec remises des prix.

### Participation

Les étudiants de maîtrise et de doctorants, les boursiers postdoctoraux et autres chercheurs émergents dans le domaine de l'eau et du climat et dans les domaines d'étude et de recherche connexes et leur pays de provenance dont notre pays la République Démocratique du Congo, la Zambie, la Namibie, le Zimbabwe, la Tanzanie, le Cameroun, et le pays hôte l'Afrique du Sud.

### Impacts de l'école d'été sur notre vision sur l'eau et le climat

Nous avons acquis beaucoup de notions relatives à l'eau et au climat surtout que son thème phare était école d'été internationale sur l'eau et le climat. En tant que futur gestionnaire des ressources en eau nous devons toujours avoir un aperçu général sur le climat car l'eau est étroitement liée aux paramètres climatiques notamment : température et humidité. Actuellement avec le changement climatique, les ressources hydriques sont de plus en plus menacées et vulnérables.

Notre vision des choses a changé dans le domaine de la gestion de l'eau, de comprendre comment aborder la question de la gestion de l'eau, car nous nous rendons compte que ce n'est pas seulement une question nationale mais aussi internationale.

Hormis ce qui précédé, nous avons développé la capacité de travailler en équipe dans la transdisciplinarité et trouver la solution avec les collègues et chercheurs d'autres pays.



### Déroulement de la formation

#### Conférences interactives

Nous avons appris quelques enseignements notamment:

- Eaux souterraines : introduction, sa gouvernance, son adaptation au climat et la Modélisation aussi très important dans le cas des eaux souterraines et du climat pour la bonne gestion et les prévisions.
- Recherche:
  - Nous avons vu exigences Éthique et intersectionnalité des recherches (études) sur l'eau et le climat
  - Conception de la recherche pour rédaction de projet de recherche, travail scientifique et leurs publications en des articles.
- Les Sensibilisation de Climat et Eau dans l'approche aux ODD 6 et ODD 13
- Lien eau-énergie-alimentation
- Application thermique et des matériaux de l'énergie solaire
- Outils de surveillance eau-climat
- SIG et télédétection
- Cartographie des risques d'inondation à l'aide d'ArcGIS Pro ou ArcGIS Pro Intelligence
- Sensibilisation de Climat et Eau dans l'approche aux ODD 6 et ODD 13



## Réflexions sur l'International Summer School par des étudiants de l'Université de Kinshasa...Cont'd

### Pièce théâtrale

Inspirer par les réels problèmes de l'Afrique et sous la supervision de la professeure Samba venant du Cameroun de l'Université Yaoundé, tous les étudiants avons réalisé la pièce théâtrale de la sensibilisation des ODD 6 et 13, chose que nous avons résolution de faire au sein de notre communauté.



Les prélèvements des échantillons des eaux ont été collecté, amener au laboratoire Nort-West University pour les analyses chimiques et microbiologique, les résultats sont discutés en équipe et rédigé dans le rapport où les recommandations étaient formulées pour chacun de site en rapport avec leurs problèmes.



### Concours des participants

#### - 3Minutes Thesis

Ce concours permet aux scientifiques de faire une présentation pertinente, motivée, brève, claire et concise de leur projet de recherche.

#### - Slam Science

Ce Concours à la présentation de solution et sensibilisation de la population pour des mesures d'adaptation et d'atténuation aux effets de changement climatique.

La RDC a remporté le prix par l'exposé de madame Cynthia MWAMBA SAFI et Chizanga de la Zambie sur le thème : « Nexus Climat-Eau-Migrations-Conflits dans le Bassin du Congo : Analyse des Interactions en Vue de Renforcer la Résilience des Communautés.

### Conclusion

En guise de conclusion, le Summer School était une très belle expérience pour nous les apprenants de l'Ecole Supérieure de l'Eau dans la mesure où cela nous a permis d'acquérir de nouvelles notions relatives à l'eau et au climat mais aussi certains outils de la nouvelle technologie notamment Qgis, Arcgis.

### Des sessions pratiques

Elles ont permis de passer à la pratique de cours magistraux et ont permis les travaux en équipes entre participants

### Travaux de terrain/Excursions

Deux descentes ont été effectuées sur 2 sites, comme c'est toujours crucial de concilier la théorie à la théorie, en l'occurrence la réserve naturelle de Molemane Eye et la Réserve de biosphère de Groot Marico, ces deux sites visités nous ont permis de comprendre les impacts du changement climatique.



## Reflections on the International Summer School by Students from the University of Zambia

Five students from the University of Zambia (UNZA) attended the summer school and they consisted of three masters and three doctoral students. The master students were Chisanga Lyoba, Geoffrey Mwananshiku and Muyaka Kamamba, whereas the three doctoral students were Chomba Innocent Chomba, Micheal Katongo Phiri and Musyani Siame.

The International Summer School was a hybrid (in-venue and online), interactive and multi-disciplinary event that aimed to strengthen capacity to achieve Strategic Development Goal (SDG) 6 on access to water and sanitation for all, and SDG 13 on climate action. It was structured in a manner that included indoor morning and afternoon sessions during the weekdays, and outdoor excursions during the weekends. The summer school also included raising awareness for SDG6 and SDG13 through theatre for development activities that were coordinated by Professor Emelda Samba and Mr. Constant Bikme from the University of Yaounde in Cameroon

The summer school accorded the students so many positive things. The knowledge and skills gained shall not only be used to advance our academic endeavors but also applied in real life. The summer school gave the students the opportunity to create networks both academically and socially. It also enabled them to affiliate to networks which are vital in professional life. The lectures have taught the students that they can do greater things through research. Three of the students came in second for the 3mins competition and the 5mins science slam competition.

The outdoor activities of the summer school were amazing and very informative. students participated in two research study tours for Molemane Eye and Groot Morico Nature Reserves as shown in figs: 10, 12 & 13 . Students acquired knowledge about the river systems, water and soil sampling and how the reserves contribute to the conservation of nature particularly water and trees. We also learnt that Molemane Eye has one of the cleanest natural waters in the world.

The scope of the indoor sessions and lectures included skills and knowledge that would strengthen the knowledge of students on SDG6 and SDG13, and prepare the students for water-climate research. These sessions ranged from ethics, proposal preparation and article writing to water governance, Integrated Water Resources Management (IWRM) and climate modelling



Hiking in Croot Marico



Alinah Segobye giving a lecture

### Students' Achievements



Chisanga Lyoba



Geoffrey Mwananshiku



Michael Phiri

Among the many lessons learnt, one important thing to note was that SADC and East African nations are grasping with almost the same challenges regarding water and climate change impacts. This calls for collective decisions and knowledge sharing through symposiums to ensure collaboration in finding solutions and complementary efforts of actions towards the implementation of Africa's Agenda 2063 and achieve SDGs goals.

We also learnt that research has the power to bring together people of various languages and countries from South African Zulu languages to Tanzania's Swahili through Zambia's Bemba to Zimbabwe's Shona to Cameroon/DRC's French and also Namibia. This was a great meeting because we tend to appreciate and respect other people's culture and language by subscribing to the concept of the world being the global village.

## Reflections on the International Summer School by Students from the University of Zimbabwe

Five Students from the University of Zimbabwe attended the International Summer School and these are Zivai Pswarayi, More-Grace Hungwe, Emmanuel Hweru, Delight Bhumira and Valentine Tawedzera.

The main activities of the summer school included training on research writing, theatre workshops and courses that included introduction to integrated water resources management, ethics and climate modelling by various Professors. The main aim of these activities was to equip students with knowledge on Sustainable Development Goals (SDG) 6 and 13 focusing on water and climate action.

Of particular significance, the theatre workshop led by Professor Emelda Sampa. This was very crucial as it built unique skills for community engagement, confidence and unity among people and communities. Theatre activities were undertaken by all the participants from different countries namely Zimbabwe, Tanzania, Zambia, The Democratic Republic of Congo, South Africa, Nigeria, Cameroon and Namibia.

Field trips were organized to two important water sources in Mahikeng and as well as a water treatment plant, Molomane Eye and the Groot Marico conserved Biosphere. We were able to observe as well as collect water samples for water quality analysis so as to assess the quality of the water from the large water bodies (eyes). We took a lot from the experience as we were able to observe the need for an integrated approach to managing of water resources in order to be able to provide for all the key stakeholders of the water sources. The participants were also given the opportunity to author book chapters based on their field trip excursions.



More-Grace, Zivai, and Emmanuel took part in the three-minute thesis competition. The goal of the 3MT presentation was to present one's research in three minutes in a way that any audience can understand. Emmanuel finished third, raising the University of Zimbabwe flag.



All the 5 participants presented in a 5 Minute Science Slam. The aim of the competition was for the participants to come up with innovative solutions for various water and climate problems they may have observed. The competition was cutthroat and the students thoroughly enjoyed the experience.



## The Water – Energy – Food Nexus Winter School for Southern

The Water Energy Food Nexus winter school was successfully held at the University of Pretoria's Future Africa campus from 8 to 12 August 2022. This Winter School was held as a capacity-building initiative to support early career researchers, postgraduate students, managers, and practitioners in understanding nexus thinking, particularly the WEF nexus, as a transformative approach to sustainable natural resources management and socio-economic development.

As the field of nexus research is relatively recent, during the WEF Nexus Winter School, participants were exposed to this rapidly developing and critically important way of thinking. Participants improved their knowledge of the WEF nexus concepts, how to facilitate discourse, and new frameworks, tools, and methods for analyzing the WEF nexus. The online WEF Nexus Masterclass is a feeder and preparation for the face-to-face Winter School.

The winter school was attended by a total of 32 participants mainly from Southern Africa and some from the United States of America.



### Objectives of the WEF Nexus Winter School

The objective of the WEF Nexus Winter School was to build on the understanding of the WEF nexus in order to improve evidence-based decision-making capacities of early career researchers (< 5 years post Ph.D.), postgraduates (Master and Ph.D.), managers, and practitioners towards:

- Achieving simultaneous WEF securities,
- Sustainable natural resources management,
- Socio-economic developments,
- Understanding WEF trade-offs and synergies,
- Innovating through the WEF nexus for job and wealth creation, and
- Linking science to informing policy and decision-making in their respective countries.

Particular emphasis is set on developing transdisciplinary professional competencies to prepare participants to address complex grand challenges through transformative approaches.

The Winter School was preceded by a Masterclass which was held online on 13–15 June 2022 and attended by more than 60 participants. The other Masterclass was held in May 2021 and attended by more than 80 participants. The two Masterclasses introduced participants to the WEF Nexus thinking, initiatives, and the link to global challenges such as Climate Change and achieving the SDGs

The winter school focused on:

- Improving the ability to conceptualize the WEF Nexus linkages and potential impact on resource
- Management and regional policies,
- Strengthening skills and knowledge about tools and methods for WEF Nexus assessments, planning, monitoring, and evaluation; and
- Networking and mentoring, i.e., improving international communication between practitioners, postgraduates, early career researchers, senior researchers, and experts to build and consolidate a WEF network in southern Africa.

### WEF Nexus Winter School Organizers

The Winter School was organized by the following institutions:

- IHE-Delft taught participants on WEF nexus frameworks, tools, and indicators, linking them to achieving SDGs, sustainable food systems, and a circular economy and nexus relationships using a case study of selected southern African cities
- Global Water Partnership Southern Africa - provided a WEF nexus discourse in Southern Africa, to participants and how the WEF nexus can be used to facilitate multi-partner and multi-level discourse
- Water Research Commission - exposed participants to real-life interlinkages and how the WEF nexus can be applied to informing solutions to real-life challenges
- University of KwaZulu Natal and the International Water Management Institute - provided a background and introduction to the concept of nexus thinking and how it has emerged, as well as various other nexus that exists. Together with IHE-Delft the role of UKZN was also to develop a WEF nexus framework.
- WaterNet - coordinated the planning of the Winter School, with material and technical support from regional and international strategic partners.



## Human Capacity Development for Lesotho in Integrated Catchment Management (ICM): A Focus on the Tertiary Sector and Short Professional Courses

In an effort to curb the prevailing land degradation that has led to massive loss of tonnes of top soil and reduction of arable land in the catchments of Lesotho, the Government of Lesotho with financial support from the European Union and the Germany Federal Ministry for Economic Cooperation and Development (BMZ), is implementing an Integrated Catchment Management (ICM) programme under a Sesotho brand name ReNOKA, which when translated to English means, “we are a river”. ReNOKA aims to implement ICM in line with climate change adaptation principles that will rehabilitate degraded watersheds across the country and to put in place prevention measures that halt further degradation of Lesotho’s catchment areas. In order to guide implementation of this massive programme, the EU and BMZ commissioned the Deutsche Gesellschaft für International Zusammenarbeit (GIZ) to support the Government of Lesotho in ICM implementation.

WaterNet was contracted by GIZ to support Lesotho’s Integrated Management Unit (ICU) in building human capacity in integrated catchment management in the implementation of the project on **Human Capacity Development for Lesotho in integrated Catchment Management (ICM): Focus on the tertiary sector and short professional courses**. The project is due to end in December 2023.

The project has the following work packages:

- Work Package 1: Assessment of capacity gaps in IWRM/ICM in tertiary education institutions (i.e. NUL, Lerotholi Polytechnic and the Lesotho Agricultural College) and among natural resources management professionals. Under this work package a needs assessment will be undertaken to systematically and scientifically identify the gaps that will be addressed under work packages 2 and 3.
- Work Package 2: Educational capacity building at graduate and postgraduate levels. The objective of this work package is to build knowledge capacity on IWRM/ICM at graduate and post-graduate levels. This work package will be divided into the following six sub-work packages:
  - Sub-work package 2.1: Under this work package the post of an Academic Coordinator will be created and strengthened for IWRM/ICM at NUL. The Academic Coordinator will coordinate and provide guidance in all academic matters at undergraduate and postgraduate levels and research related to IWRM/ICM at the NUL and other high education institutions in the country.
  - Sub-work package 2.2: Establishment of Introductory Courses in IWRM/ICM at Diploma and Undergraduate Levels aimed at building knowledge on IWRM/ICM at the two levels for enhancing current and future management of natural resources.
  - Sub-work package 2.3: Setting up and running of a Postgraduate programme, i.e. MSc in Integrated Water Resources Management/ Integrated Catchment Management at NUL. The objective under this work package it to systematically build the relevant knowledge base at higher academic level for the management of natural resources in Lesotho conversant in IWRM/ICM.
  - Sub-Work Package 2.4: Provision of Post-Graduate Scholarships to support sub-work package 2.3 through relevant financial support for a limited number of students in the form of scholarships as a step towards building the managerial base for IWRM/ICM.
  - Sub-work package 2.5: Organizing internships for a limited number of qualifying Lesotho nationals in national, regional and international organizations which focus on IWRM/ICM related issues so that they can gain the necessary practical grounding in the area.
  - Sub-work package 2.6: Coordination of research work of post-doctoral fellows who will undertake academic and action-oriented research aimed at informing ICM processes for current and future decision making for enhancing key natural resources management in Lesotho.
- Work Package 3: Implementation of short courses for professionals from different natural resources sectors aimed at building the knowledge and skills capacity of the already practicing professionals in IWRM/ICM in Lesotho.
- Working Package 4: Outreach and Dissemination of project outcomes to a wider audience in order to promote the adoption of best practices and knowledge sharing.



## Human Capacity Development for Lesotho in Integrated Catchment Management (ICM): A Focus on the Tertiary Sector and Short Professional Courses... Cont'd

### Human capacity needs assessment

In order to ensure the implementation of project activities, WaterNet initiated a human capacity needs assessment (CNA) for the project that was aimed at developing a baseline of human capacity gaps in ICM among key institutions involved in ICM in Lesotho. These institutions included academic institutions such as National University of Lesotho (NUL), Lesotho Agricultural College (LAC), Lerotoli Polytechnic (LP), government departments responsible for water, range management, forestry, agriculture, soil and water conservation and environment. In the tertiary sector, the CNA identified ICM gaps in the curriculum and, therefore, provided recommendations on how to mainstream ICM courses in the diploma programmes at LP and LAC and in the undergraduate and postgraduate programmes at NUL as well as modalities for establishment of a Master of Science in ICM at NUL to develop the professional capacity. Additionally, the CNA provided recommendations on the scholarship mechanisms to support Basotho in MSc ICM at NUL and the modalities for establishing and strengthening the position of an Academic Coordinator who will be responsible to coordinate the inter-institutional academic activities of ICM. The CNA also provided advice on the mechanisms for engaging the post-doctoral fellows at NUL.

To support human capacity building in the government departments that deal with natural resources management, the CNA provided advice on the proposed arrangements for provision of internships for Basotho in international organizations that are advanced in various aspects of natural resources management. The CNA also facilitated consolidation of a list of 12 short professional courses to meet the skills and knowledge gaps in ICM implementation.

### Short professional courses

A total of 12 short professional courses will be undertaken under the project, identified during the human capacity needs assessment. The following are the courses:

1. Project Planning and Knowledge Management for ICM
2. Stakeholder Engagement and Community Mobilization
3. Water and Environmental Governance (include law, ethics)
4. Approaches and Tools for Sustainable Natural Resources Management in the Context of ICM
5. Natural Capital Accounting
6. Land Use Planning
7. Soil and Water Conservation
8. Climate Change Risk Analysis and Resilience
9. Water Resources Monitoring and Assessment
10. Remote Sensing and GIS Applications for ICM
11. Introduction to Data Science Applications for ICM
12. ICM Planning and Implementation/Conceptualization and Operationalization for ICM/IWRM

The first two trainings have already been undertaken. The other 10 will be implemented between February and December 2023.

Other activities that will be implemented in 2023 include the following:

- The commencement of the MSc in Integrated Catchment Management at the National University of Lesotho which will see 15 Basotho nationals being awarded scholarships to undertake the programme;
- internship programme that will send out 10 selected young professionals from Lesotho to relevant organizations in the SADC region to learn practical knowledge and skills in ICM related areas;
- Four post-doctoral candidates who will be engaged and undertake research in ICM related areas



## WaterNet Alumni and former UZ Department of Civil Engineering students give a special tribute and appreciation to Eng. Zvikomborero Hoko

By Faith Chivava and Luckson Katsi (WaterNet Alumni)



Eng. Zvikomborero Hoko retired from full-time lecturing at the University of Zimbabwe in August 2022 after 20 years of service. He was a Senior Lecturer in the Department of Civil Engineering. Having joined the Department of Civil Engineering on a full-time basis in January 2002, he was one of the long serving staff members in the department and longest serving member in the Water Section since the inception of WaterNet and the funded MSc in Integrated Water Resources Management (IWRM) programme that started in 2003. The Department of Civil Engineering supported WaterNet in many ways including hosting its Secretariat since its inception. Eng. Hoko participated in the planning of the IWRM Programme which was managed by the Water Section of the Department of Civil Engineering (UZ). Eng. Hoko was also key in the development of the programme regulations and other guidelines.

Following news of his retirement, some students who passed through his hands, both undergraduate and postgraduate students decided to honour him for his contribution to their career development in various ways and forms. Other students held individual appreciation events and others handed over individual appreciation gifts.

The WaterNet Alumni and other former UZ Department of Civil Engineering students organised an appreciation event at Crown Plaza, Harare on 29 December 2022. Contributors for the event were also drawn from childhood friends, high school and university classmates, workmates and other associates. Contributions were in various forms. Among them, cash and a memory book of stories and reflections collected independently by an organizing committee comprising of former students ( Faith Chivava, Luckson Katsi, Tapiwa Makoni, Delight Bhumhira, Innocent Magwa, Pride Mutekwa, Kuda Gapara, Rutendo Mandere and Renny Munyai).

The 29 December event was attended by more than 80 participants in person plus online attendance from various parts of the world. In person, attendance was among others by Professor Onema (WaterNet Manager), Ms. Marjorie Mpundu (World Bank Group Country Manager for Zimbabwe), Eng. Thami Mpala (Zimbabwe Institution of Engineers President), Eng. Samson Shumba (Chairman, Department of Civil Engineering, UZ), Ms Belladonah Pondiwa (Institute of Water and Sanitation Development-IWSD), some WaterNet Alumni, some undergraduate and postgraduate former students who passed through Eng. Hoko's hands, some current students, Eng. Hoko's family and relatives, friends and associates. On the 29th of December, a copy of the memory book was presented to Eng. Hoko as a gift together with other gifts.

"I feel very humbled and honoured to have been the centre of this initiative. My hope is that this is the beginning of a pipeline of a series of initiatives and active engagement of the alumni meant to contribute towards the sustained and smooth operations of the department and university" appreciated Eng Hoko

From left, Delight Ms Bhumhira & Ms Faith Chivava (WaterNet Alumni) handing over one of the gifts to Eng. Hoko during the event at Crown Plaza, Harare 29 December 2022. (Eng. Hoko's dressing courtesy of gifts by Malawian and Tanzanian former students)



Having a glance of the Memory book: Professor Onema

From left, Delight Ms Bhumhira & Ms Faith Chivava (WaterNet Alumni) handing over one of the gifts to Eng. Hoko during the event at Crown Plaza, Harare 29 December 2022. (Eng. Hoko's dressing courtesy of gifts by Malawian and Tanzanian former students)

## Congratulations are in order...



Prof. Samson Sajidu  
was appointed as the  
Vice-Chancellor of the University  
of Malawi (UNIMA).

Prof. Sajidu becomes the  
10<sup>th</sup> Vice-Chancellor of UNIMA

## Congratulations are in order...



Prof. Ketlhatlogile Mosepele was appointed as the second Vice Chancellor of the Botswana University of Agriculture and Natural Resources for a period of five years with effect from the 1<sup>st</sup> November 2022.

Prof Mosepele was previously with the Okavango Research Institute, University of Botswana and has always been active in WaterNet activities



WaterNet Secretariat, Private Bag X2046, Mmabatho,  
Mafikeng, 2745, South Africa  
Email: [waternet@waternetonline.org](mailto:waternet@waternetonline.org)  
Web: [www.waternetonline.org](http://www.waternetonline.org)

