

Programme

20th WaterNet/WARFSA/GWP-SA Symposium on:

Integrated Water Resources Development and Management: Leaving no one Behind for Water Security in Eastern and Southern Africa

Indaba Hotel, Spar Centre, Fourways,
Johannesburg, South Africa

30th October – 1st November 2019

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

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Integrated Water Resources Development and Management: Leaving No One Behind for Water Security in Eastern and Southern Africa

Indaba Hotel, Spa & Conference Centre, Fourways, Johannesburg, South Africa

30th October – 1st November 2019

Programme Manager: Dr Washington Nyabeze

Tuesday 29 October 2019

14:00 - 20:00

Registration of Participants
Venue: Kgotla Foyer

Wednesday 30 October 2019

06:30 – 08:00

Registration of Participants/Welcome with tea
Venue: Kgotla Foyer

08:00 – 10:00

Official Opening
Director of Ceremonies: Ms. Lebogang Mawelela
Venue: Kgotla 1

08:00

All Participants and Guests take seats, Singing of the South African National Anthem

08:05

Introductions by the 20th Symposium Local Organising Committee Chairperson: Dr. Caliphs Zvinowanda

08:10

Welcome Speech by Vice-Chancellor of the University of Johannesburg: Prof. Tshilidzi Marwala

08:20

Remarks by the Chairperson of WaterNet Trust: Prof. Hodson Makurira

08:25

Remarks by the SADC Representative, A/Director Infrastructure and Services: Dr. Patrice K Kabeya

08:35

Remarks by a WaterNet Founding Member: Prof. Alaphia Wright

08:45

Inauguration of the Symposium by the Guest of Honour: Deputy Minister of Human Settlements, Water and Sanitation, Honourable David Mahlobo

09:00

Setting the Scene: Climate change, Africa and the need for capacity building: IHE Rector, Prof. Eddy Moor

09:15

Keynote Address: Keynote Address: Some (water) for all, forever: Prof. Jacqueline King

09:35

Signing of Memorandum of Understandings between WaterNet and the following organisations:

- Water Research Commission of South Africa
- AU/NEPAD SANWATCE

Press Statement

10:00 – 11:00

Group Photo
Tea / Coffee

Sessions starts						
11:00 – 13:00	Changing hydro-climatic regimes and planning tools for climate resilient pathways		Water, Land, Energy and Agriculture		Open Special Session	AfriAlliance Special Session
	Venue: Kgotla 1		Venue: Auditorium		Venue: Lecture Room 7	Venue: Lecture Room 8
	Chair: Dr. Tendai Sawunyama Rapporteur: Mr. Hubert Samboko		Chair: Dr. Jean-Marc Mwenge Kahinda Rapporteur: Mr. Dumsani Hlanze		Chair: Ms. Annelieke Duker Rapporteur: Dr. Jeremiah Kiptala	Chair: Ms. Bettina Genthe Rapporteur: Dr. Tendai Polite Chibarabada
11:00	W. Nyabeze	Determination of Precipitation Patterns for the Upper Zambezi River Catchment Using Large Gridded Precipitation Data Sets	T. Mabhaudhi, L. Nhamo, S. Mpandeli, N. Sobratee, D. Naidoo, S. Liphadzi & A. Modi	Modelling the water-energy-food nexus: a focus on improving rural livelihoods in southern Africa	<p>The present and future of alluvial aquifers as nature-based solutions for enhancing rural livelihoods in (semi-) arid Africa</p> <p>Convenors: Instituto Superior Politécnico de Gaza, University of Namibia, Jomo Kenyatta University of Agriculture and Technology, South-Eastern Kenya University, Mekelle University, University of Botswana, National University of Science and Technology, IHE Delft, Dabane water works, Acacia Water, and Practica Foundation.</p> <p>Programme</p> <p>Introduction: A. Duker</p> <p>Key note speaker: C. Zawe</p> <p>State of the sand: Current research findings and opportunities. 5-minute updates from:</p> <ul style="list-style-type: none"> Ethiopia (E. Yazew), Kenya (J. Kiptala), Mozambique (C. Cambaza), Namibia (S. Uugulu), Zimbabwe (L. Nkomo), Sudan (M. Hulshof) Hydrological opportunities in three basins (T. Stigter) Experiences in solar-powered irrigation (B. van den Pol) <p>Discussion on opportunities for further collaboration (<i>hydrology, irrigation development, and catchment impact</i>)</p> <p>Conclusion and way forward</p>	<p>BROKERAGE ROADSHOW: Social Innovation and IWRM in the face of climate change: Convened by <i>AfriAlliance</i></p> <p>11.00 – 11.15 Introduction and keynote on the AfriAlliance concept of “Social innovation”: Prof. J. Kileshye Onema, <i>WaterNet</i></p> <p>11.15 – 11.35 Innovation pitches (2 minutes each) Facilitator: T. Chauke – WRC</p> <ol style="list-style-type: none"> Dr. Pienaar: <i>The Tailor-Made Socio-Economic Approaches for Integrated Water Management in Rural to Urban Driven Mutations (SO - WAT) Action Group</i> M. Mokwena: <i>Bashomi Trading</i> N. Ndebele & S. Teane: <i>Puremadi</i> C. Ngwenya: <i>Maji 1200</i> D. Malik: <i>Doctors without Borders (MSF-Médecins Sans Frontières)</i> W. Simmons: <i>Motheo Pty Ltd</i> S. Shabangu: <i>Herefords Biochar Production</i> M. Gitari: <i>Environmental Remediation and Nano (EnViReN) Sciences Group</i> M. de Groen & A. Ndetekaya: <i>Trans-African HydroMeteorological Observatory</i> <p>11.35 – 12.05 Innovation showcasing, demonstration & matchmaking (one on one): Participants have 30 minutes to meet the innovators who are of particular interest to them, to ask questions and discuss on their respective innovations.</p> <p>12.05 – 12.40 Panel discussion (incl. Questions & Answers with the audience) Facilitator: Dr. M. Thagale, WRC</p> <p>Panellists:</p> <ol style="list-style-type: none"> Eng. G. Chingambu - <i>Manager SADC WaterFund, DBSA Bank</i> Dr. H. Pienaar - <i>Water Resources Manager, CSIR</i> Dr. F. Makoni - <i>WASH Regional Director, World Vision</i> Dr. L. Magole - <i>University of Botswana</i> Dr. M. Werner - <i>IHE Delft Institute for Water Education</i> <p>12.40 – 12.55 Dissemination of AfriAlliance Products Eng. A.M. Vanlieshout & S.M. Njuki, <i>University of Twente</i></p> <p>12.55 – 13.00 Conclusion and Evaluations T. Quayle, <i>ICLEI - Africa</i></p>
11:15	N. Makhalemele, A. Mhizha & W. Gumindoga	Assessment of Snowmelt Run-Off Contribution into the Senqu River	M. Chimweta, I. Wadzanayi Nyakudya, L. Jimu & A.B. Mashingaidze	Foliar application of ammonium nitrate fertilizer as top dressing increases maize grain yield in flood recession cropping in the Zambezi valley, northern Zimbabwe		
11:30	S. Mpofu & J. Ndiritu	Generalised Storage-Yield-Reliability Relationships for the Sizing of Rainwater Harvesting Systems in South Africa	D. Sengani, C. Musvoto, C. Bowe, D. Jordan & J.M. Mwenge Kahinda	A review of soil quality indicators used to assess SLM in degraded South African drylands		
11:45	M. Moila & M. Dinka	Determination of discharge coefficient for a weir flow	O. Pili & B. Ncube	Coping and adaptation strategies for agricultural water use during drought periods in the Overberg and West Coast Districts, Western Cape, South Africa		
12:00	L. Nhamo, T. Mabhaudhi, S. Mpandeli, D. Naidoo, S. Liphadzi, J. Botai & A. Modi	A flood monitoring and forecasting early warning system for southern Africa	M. Fanadzo, B. Ncube, A. French & A. Belete	Drought coping and adaptation strategies by smallholder farmers in South Africa		
12:15	F. Mwale, T. Kamanga, S. Tantaneea & P. Buranajarukorn	Vulnerability Profile to Floods and Droughts in Malawi - A Multi Hazard Perspective	H. Mugiyo, V.G.P. Chimonyo, R. Kunz & T. Mabhaudhi	Multi-criteria land evaluation for suitability analysis of neglected and underutilized species in South Africa		
12:30	T. Chipere, W. Gumindoga, J.M. Kileshye Onema, A. Mhizha & D. Rwasoka	Future flood inundations under climate change scenarios: A case of Middle Zambezi Basin in Zimbabwe	F. Tembon, M. Mujuru & M. Tekere	Water management efficiency in bioethanol value chain: Best practices for South Africa		
12:45	N. Badana, J. Norbert & S. Mkhandi	Flood Risk Assessment in Luvuvhu River Catchment	S. Uugulu & H. Wanke	Determination of active root depth and water sources of woody plants using deuterium tracer, Ebenhaezer, Namibia		
13:00 – 14:00	Lunch Break					

14:00 – 17:00	Changing hydro-climatic regimes and planning tools for climate resilient pathways		Water, Land, Energy and Agriculture		Open Special Session	Open Special Session
	Venue: Kgotla 1		Venue: Auditorium		Venue: Lecture Room 7	Venue: Lecture Room 8
	Chair: Dr. Tendai Sawunyama Rapporteur: Ms. Tendai Chipere		Chair: Dr. Jean-Marc Mwenge Kahinda Rapporteur: Mr. Dumsani Hlanze		Chair: Dr. Kuiru Tjipangandjara Rapporteur: Ms. Julienne Ndjiki	Chair: Mr. Bismark Norgbe Rapporteurs: Mr. Wonder Mafuta & Mr Belis Matabire
14:00	P.S. Kakoko & D. Mulungu	Early warning simulation for flood risk areas of Msimbazi River	P. Nzuzi, S. Madonsela, A. Ramoelo, J. Odindi & J.M. Mwenge Kahinda	Predicting land degradation using Sentinel 2 and environmental variables in Lepellane catchment of the Greater Sekhukhune District, South Africa	Water-Energy-Food (WEF) Nexus Policy Dialogue <i>Convenor: GWPSA</i> Welcome and introductions GWPSA Chairperson Introduction to the WEF Nexus approach: Mr. K. Jembere The SADC WEF Nexus regional approach: Dr. P. Kabeya Keynote address: Research agenda and initiatives on WEF: Dr. T. Mabhauti Facilitating investment through a Nexus approach: The SADC Nexus Project Screening: Prof J. Blignaut Plenary discussion: Recommendations on actions to be taken by Member States in embracing the WEF Nexus approach All Vote of thanks and closing: Ms. E. Magagula	Innovation and appropriate technologies for reaching Impact in WASH programming: Leaving no one behind Special Session <i>Convenor: World Vision</i> Programme Arrival and introductions All Welcome and Introduction to World Vision, who we are and our programmes? Mr. M. Kelly Setting the Stage: Why are we here; Partnerships and Research Capacity building Dr. F. Makoni Partnerships and Research Capacity building Dr. E. Opong Low Cost Rural Water Treatment Supply Systems: A case study of Lwamaggwa Piped Water Supply Mr. P. Oyisege Accelerating WASH universal coverage in remote rural villages of Kenya Ms. P. Wamwala and Ms. E.N. Atandi Reverse osmosis for water supply in arid rural areas Video Presentation WASH in fragile context , importance of water resource management Mr. W. Mafuta Inclusive WaSH and its impact on the vulnerable children: Ms. Z. Msibi Water quality and HH behaviors: Ms. R. Riwa WASH technologies: Video Business connect Role of Private sector in water supply Ms. N. Ugabinema Solar Powered systems: Is the way to go for sustained small scale rural water supplies Mr. M. Demissie Question and Answer: Discussion Closing
14:15	E. Niipare & D. Mashauri	The assessment of floodwater harvesting infrastructure in the Namibian Cuvelai-Etoshia Basin	K. Beenen, N. den Besten, R. de Jeu, P. van der Zaag, S. Lhermitte, M. Coenders-Gerrits & S. Steele-Dunne	Assessment of spatial variability in different evaporation algorithms: a case study on sugarcane fields in Mozambique		
14:30	L. Chikwiramakomo, M.D. Shekede, W. Gumindoga, T.W. Gara, T. Chuma & M. Ngwenya	Modelling flood hazard in dry climates of southern Africa: a case of Beitbridge, Limpopo Basin Zimbabwe	A. Duker, T.A. Mawoyo, A. Bolding, P. Van der Zaag & C. De Fraiture	The individualisation of irrigated farming using alluvial groundwater in southern arid Zimbabwe		
14:45	C. Mulowayi, A. Alexander, J. Nobert & C. Mbudi	Modeling Groundwater Flow Under Chaotic Urbanization Constraints In Kinshasa Capital Region (D.R. Congo)	A. Ngulube, R. Holm & M. Malota	Management and operation of irrigation water management structures at sheme level: knowledge gaps, attitudes, practices and farmer experiences		
15:00	M.K. Bissessur & M.D. Nowbuth	Understanding the hydrological catchments of Mauritius and their relation with rainfall time series data	S.S. Singwane, B. Nhlengethwa, S. Doctor Mabaso, I.B. van Zuydam & S.F. Mamba	An assessment of socio-economic impacts of the climate smart gardens project in low income residential areas in Eswatini: A Case of Mbabane City		
15:15	N. Mthethwa, A. Taigbenu, J.M. Mwenge Kahinda & E. Kapangaziwiri	Changing hydroclimatic and discharge patterns in the Olifants sub-basin, South Africa	V. Malinga, S. Mabaso, J. Matondo & S. Singwane	Irrigation water use and its influence on Lusutfu River flow in the Lowveld of Eswatini		
15:30	W. Mafuta, S. Mpala, E. Palula & M. Busingye	Exploratory analysis of remotely generated water sources data in southern Somalia states	D. Hlanze, D. Mulungu, P. Ndomba & S. Tfwala	Estimating soil loss rate and sediment yield of the proposed Ngololweni earthdam, Kingdom of Eswatini		
15:45	S.S. Moges & M.O. Dinka	Groundwater Vulnerability Assessment Methods: A Review	E. Mudenda, L.M. Chabala & I.A. Nyambe	Agricultural Expansion, Practices and Water Quality of the Lunsemfwa Sub-Catchment in Zambia		
16:00 – 16:15	Tea break					

16:15	L. Lalumbe	Groundwater quality analysis in the Eastern Kalahari Hydrogeological region, South Africa	W. Tesfuhoney, A.R. Dzvene, M. Ravuluma, S. Walker & A. Fourie & Z .Bello	Radiation and water use efficiency in maize-bean intercropping under in-field rainwater harvesting (IRWH)	Open Special Session	Open Special Session
16:30	E. Kanema & W. Gumindoga	Effects of changing climate and landuse on the groundwater potential of Chongwe and Rufunsa Districts of Zambia	E. Alavaisha, S.W. Lyon & R. Lindborg	Assessment of Water Quality Across Irrigation Schemes: A Case Study of Wetland Agriculture Impacts in Kilombero Valley, Tanzania	Venue: Lecture Room 7 Chair: Dr. Rashid Mbaziira Rapporteur: Ms. Joanna Fatch	Venue: Lecture Room 8 Chair: Eng. Kennedy Nyundu Rapporteur: Ms. Faith Chivava
16:45	Discussion		J. Masanganise, R. Kunz, T. Mabhaudhi & M. Savage	Evapotranspiration Estimates of Soybean using Surface Renewal: Comparison with AquaCrop	<p>The Water Research Fund for Southern Africa: A conversation on funding regional collaborative research</p> <p><i>Convenors: AU/NEPAD SANWATCE and WaterNet</i></p> <p style="text-align: center;">Programme</p> <p>Value addition of a regional research agenda: SADC Perspective – SADC Water Division</p> <p>Status of the SADC Research Agenda: Prof. E. Manzungu</p> <p>Ongoing research initiatives in the SADC region: AU/NEPAD SANWATCE and WaterNet</p> <p>Facilitated discussion on the way forward: Dr. R. Mbaziira</p>	<p>Mapping and protecting Water Resources Protection Areas for Zambezi River Basin Water security <i>Convenor: World Wide Fund – Zambia</i></p> <p style="text-align: center;">Programme</p> <p>Welcoming Remarks: MWDSEP</p> <p>Opening remarks and context: The policy and framework: Eng. K. Nyundu</p> <p>Overview of scientific rationale and process framework for protecting key natural infrastructure for improved water security in the Zambezi River Basin: Dr. L. Katiyo</p> <p>Scientific Paper - Areas of Aquatic Ecological Importance (AEIs) as inputs into surface Water Resource Protection Areas (WRPAs) in Zambia (N. Rivers-Moore et. al, 2019); Dr. N. Rivers-Moore & Dr. B. Paxton</p> <p>Scientific Paper - Identification of surface Water Resource Protection (B. Lerner et. al, 2019); Prof. B. Lehner</p> <p>Opportunities for operationalizing protections under complementary environmental management legal frameworks: Mr. M. Nkoya</p> <p>Opportunities for reducing hydrological risk and enhancing energy security in the Zambezi River Basin through the WRPAs framework</p> <p>Plenary and synthesis of key messages and post-session action points from participants</p> <p style="text-align: center;">Closing</p>

Poster Session Venue: Kgotla 2					Special Session Venue: Auditorium
Chair: Ms. Chetty Kershan Rapporteurs: Mr. Ernest Kanema & Ms. Ntanganedzeni Badana					Chair: Prof. Moses Chimbari
17:00-18:30	Water, Ecosystems and the Environment for Poster Presentation	Changing hydro-climatic regimes and planning tools for climate resilient pathways	Water, Land, Energy and Agriculture for poster presentation	Water governance for sustainable, equitable and affordable water services	Innovative approaches, practices and technologies for affordable water supply, and sanitation services
	Number of posters for presentation: 18 See page 12 for details regarding each poster. Posters being presented by young scientists have a green sticker or their pictures on the top right corner.	Number of posters for presentation: 6 See page 12 for details regarding each poster. Posters being presented by young scientists have a green sticker or their pictures on the top right corner.	Number of posters for presentation: 3 See page 13 for details regarding each poster. Posters being presented by young scientists have a green sticker or their pictures on the top right corner.	Number of posters for presentation: 3 See page 13 for details regarding each poster. Posters being presented by young scientists have a green sticker or their pictures on the top right corner.	Number of posters for presentation: 8 See page 13 for details regarding each poster. Posters being presented by young scientists have a green sticker or their pictures on the top right corner.
19:00 – 21:00					Welcome Cocktail Venue: Kgotla 2

Thursday, 31 October 2019

08:00 – 10:00							Scientific Plenary Session: Venue: Kgotla 1						
Chair: Prof. Pieter van der Zaag Rapporteur: Mr. Webster Gumindoga													
08:00	Prof. Pieter van der Zaag			The Coming of Age of Waternet: A Reflection of the Past, Present and Future									
08:15	Mr. P. Ramoeli			Reflections on the role of SADC in supporting capacity building initiatives									
08:30	Dr. T. Gumbo & Prof. J.M. Kileshye Onema			Current and Former Manager's reflections on the contribution of WaterNet Programmes in enhancing IWRM in the SADC Region and beyond									
09:00	Ms. J. Fatch			The WaterNet Alumni's role and contribution to capacity building in IWRM initiatives in the SADC and East African regions									
09:15	Prof. D. Mazvimavi			Reflections on the scientific successes, challenges, gaps of the Symposia since 2000 and way forward									
09:35	Dr. K. Kujinga			Video on the History of the Symposia									
09:50	All			Open Discussion									
10:00 – 10:30							Tea Break						
10:30 – 13:00		Changing hydro-climatic regimes and planning tools for climate resilient pathways			Water, Ecosystems and the Environment			Innovative approaches, practices and technologies for affordable water supply, and sanitation services			BRECcIA Special Session		
		Venue: Kgotla 1			Venue: Auditorium			Venue: Lecture Room 8			Venue: Lecture Room 7		
		Chair: Dr. Tendai Sawunyama Rapporteur: Mr. Henry Zimba			Chair: Dr. Faides Mwale Rapporteur: Mr. Neo Makhalemele			Chair: Dr. Rochelle Holm nyere Rapporteur: Mr. Cedrick Mulwayi			Chair: Prof. Cosmo Ngongondo & Prof. Mawuli Dzodzomenyo Rapporteurs: Dr. Tendai Polite Chibarabada & Ms. Catherine Tlotlo Kerapetse		
10:30	L.T. Modie, P.K. Kenabatho & M. Stephens	Investigating groundwater and surface water interactions using stable isotopes: The case of Notwane River Catchment, South East Botswana			M. Gondwe, C. Helfter, M. Murray-Hudson, K. Mfundisi, E. Mosimanyana, U. Skiba, O. Moses & I. Mosie	Methane fluxes from a pristine southern African wetland, the Okavango Delta		S. Ndulini, M. Mthembu & V. Pullabhotla	Bacillus silver nanoparticles as a heavy metal biosorbent from domestic sludge		Addressing food and water security challenges in sub-Saharan Africa using collaborative and interdisciplinary research <i>Convenors: Justin Sheffield; Genevieve Agaba; John Obiri; Mawuli Dzodzomenyo; Cosmo Ngongondo; Jean-Marie Kileshye Onema (BRECcIA)</i> 10.30 -10.35: Introduction and brief overview of BRECcIA Project: Prof. J.M. Kileshye Onema 10.35 -10.45: Bringing the communities of Southern Africa beyond short-term relief: Advances in implementation of the UNESCO SADC-WIN approach: Dr. K. Verbist Programme: Part I: Presentations: Water Resources Management Chair: Prof. Ngongondo		
10:45	M. Kalola, N. Kgabi & H. Mukendwa	Geochemical assessment of groundwater in the Kuiseb Basin, Namibia			C. Helfter, M.J Gondwe, A. Makati, M. Murray-Hudson, P. Jamwal, S. Bhattacharyya, T. Edwards, A. Pickard, L. Carvalho, J. Dreuer & U. Skiba	Hydrological controls of methane emissions in contrasting inland water bodies		S. Mchunu, S. Ndulini & M. Mthembu	Effect of microorganisms (Ochrobactrum oryzae and Bacillus subtilis) in heavy metal removal from sludge				
11:00	S. Samka & M. Dinka	Analysing the magnitude and severity of drought using the Standardized Precipitation Index (SPI): Case study in Olifants River Basin (South Africa)			B. N. Makhanya, S.F. Ndulini & M.S. Mthembu	Heavy Metals Removal by Microalgae Biofilms from Industrial Wastewater		T. Ndhlovu & M. Mthembu	Investigation of the prevalence of antibiotic resistant bacteria and their genes in wastewater				

11:15	A. Coopen, M. Boyjoo, M. Nowbuth & V. Mungul	Study of Drought in Mauritius for Improved Water Management and Disaster Risk Reduction	S. Tichapondwa & J. Newman	Effect of the TiO ₂ phase on the photocatalytic decolorization of methylene blue	N. Ndebele	Assessment Of The Use Of Silver Nitrate Impregnated Ceramic Water Filters As Point-Of-Use Water Treatment Devices	10.45 - 10.55: Analysis of extreme indices trend and change-point detection of temperature and precipitation in Lake Chad basin: B. Minoungou
11:30	R. Nguma, I. Masih, M. Werner & P. van der Zaag	Challenges and Opportunities for Hydrological drought Mitigation in the Anthropocene: The Upper Tana Basin in Kenya	M. Muloiva, S. Nyende-Byakika & M. Dinka	Review of factors affecting aeration process performance of submerged air diffuser leading to high energy cost	C. Majoka & A. Mulaba-Bafubiandi	Efficiency evaluation of the dissolved air flotation system as effluent treatment plant	10.55 - 11.05: Characterisation of increasing aridity in Lake Chilwa Basin, Malawi: O. Kamombe
11:45	D.I. Irenga, N.A Kgabi & S.A Reju	Comparative Analysis of Drought Frequency and Intensity Using Standard Precipitation Indices for Katima Mulilo and Ondangwa, Namibia	O. Izevbekhai, W. Gitari & N. Tavengwa	Optimization of silica extraction from diatomaceous earth using response surface methodology	S.M. Malunga	Photodegradation of organic pollutants in drinking water using TiO ₂ -decorated coal ash nanocomposites	11.05 - 11.15: Land cover changes and runoff assessment at sub basin level _ A SWAT application in drylands of Malawi: C.T. Kerapetse
12:00	S. Hatchard, P. Bates, F. Pianosi, S. Williamson & K. Andreadis	Estimating Optimal Small Hydropower Portfolios in Data Scarce Southern African Regions under Current and Future Conditions	O. Obijole, M. Gitari, P. Ndungu & A. Samie	Hydrothermally Treated Aluminosilicate Clays and their Application for Water treatment	W. Ngoma, Z. Hoko, S. Misi & R. Chidya	Assessment of Efficiency of a Decentralised Wastewater Treatment Plant at Mzuzu University, Mzuzu, Malawi	11.15 - 11.25: Hydrological Modelling of Ephemeral River Systems: A Case of Tiva River Catchment in Kitui County, Kenya: S. Wekesa
12:15	B. Thomas, G. Monei & O. Kenabatho	The Assessment of Actual Evapotranspiration (AET) in Botswana using remote sensing data	M. Simaubi, K. Banda & I.A. Nyambe	Use of dye tracer tests to validate the flow direction in a karst system: Laughing waters, Lusaka, Zambia	A. Munyengabe, C. Zvinowanda, J. Ramontja & J.N. Zvimba	Treatment of synthetic acid mine drainage using liquid sodium ferrate (VI) salt and limestone	11.25 - 11.35: Participatory methods of analysing determinants of water availability in wetlands of Mitundu area Lilongwe district, Malawi: F. Musa
12:30	G. Ezenne, A. Palmer & J. Tanner	An overview of uncertainties in evapotranspiration estimation techniques	N. Nyandeni, S. Ndulini & M. Mthembu	Biosorption of heavy metals from sludge using yeast biomass (<i>Saccharomyces cerevisiae</i>)	C. Majoka & A. Mulaba-Bafubiandi	Efficiency evaluation of the dissolved air flotation system as effluent treatment plant	11.35 - 11.45: Flooding from dam release and impact on water and food safety in selected dryland areas, Ghana: M. Dzodzomenyo
12:45	G. Mbokoma, S. Reju & N. Kgabi	Implementation of variational optimisation methods in hydro-climatic modelling	I. Mwangi, E. Kinyua, R. Wanjau, S. Sauda & J. Ngila	Remediation of domestic wastewater by electrochemical oxidation of dissolved organic species	N.M. Chauke, J. Ramontja & R.M. Moutloali	Utilisation of zeolite polyethersulfone membranes in salt water rejection	11.45 - 11.50: Discussion: Water Resources Management Programme: Part II: Presentations: Food security Chair: Prof. M. Dzodzomenyo
							11.50 – 12.00: A comparison of model performance in simulating maize yield in dryland regions of Sub-Saharan Africa: T.P. Chibarabada
							12.00 - 12.10: Water and food security policy analysis: methodological, theoretical framework, and challenges: H. Hunga
							12.10 - 12.20: Watershed governance for food security in the Lower Sio River Basin: A Paradox of Kenya's Devolution: N. Naburi
							12.20 - 12.30: Dry spells vulnerability mapping for Malawi in relation to soil properties and linking to food security: E.G. Chimimba
							12.30 - 12.40: Water harvesting technologies as resilience strategy for sustainable water and food security in dryland areas of Ghana: M. Dzodzomenyo
							12.40 - 12.50: Evaluating functionality of investments in mainstreaming climate change into planning, in dryland counties of Kenya: F. Ngarachu
							12.50 - 12.55: Discussion: Food security
							12.55 - 13.00: Conclusion and evaluation: Prof. J.M. Kileshye Onema
13:00 – 14:00							Lunch Break

14:00 – 17:30		Water governance for sustainable, equitable and affordable water services		Water, Ecosystems and the Environment		Innovative approaches, practices and technologies for affordable water supply, and sanitation services		Open Special Session	
		Venue: Kgotla 1		Venue: Auditorium		Venue: Lecture Room 8		Venue: Lecture Room 7	
		Chair: Mr. Reniko Gondo Rapporteur: Ms. Paula Sospeter Kakoko		Chair: Dr. Faides Mwale Rapporteurs: Ms. Tendai Chipere & Ms. Ntanganedzeni Badana		Chair: Dr. Rochelle Holm Rapporteur: Ms. Wezzie Ngoma		Chair: Dr. Marloes Mul Rapporteur: Dr. Karin Viergever	
14:00	N. Munro & O. Kweka	Why do citizens trust the public utility and private vendors in Dar es Salaam's water sector?	T. Tawha, M. Kurehwatira, W. Mafuta, W. Zendera, K. Chitotombe & D. Mlambo	Spatio Temporal Assessment of Water Quality along Odzi River in Zimbabwe between 2016 and 2018	A.M. Enitan-Folami & F.M. Swahala	Water-sanitation-energy Nexus as Sustainable Biofuel Generation from Anaerobic Digester: Future Source for Electricity Production	FAO portal to monitor Water Productivity through Open access of Remotely sensed derived data (WaPOR) Programme Welcome and introduction: Dr. M. Mul Quality assessment of the FAO Water Productivity Open Access portal (WaPOR) v1.0: M. Mul Mapping irrigated cropland areas over Africa and the Near East: L. Tits Long-term time series of satellite-based evapotranspiration measurements in the WaPOR database: K. Viergever Adequacy and equity of irrigation in Africa over the past decade: A continent-wide analysis: P. Karim Influence of spatial resolution on remote sensing based irrigation performance assessment: M. Blatchford National scale near-real time drought monitoring using open access FAO-WaPOR data portal: S. Pareeth Estimating spatial and temporal trends in water productivity in sugar cane estates across Africa using the WaPOR database: M. Mul Discussion		
14:15	M. Biyela, K. Pietersen, C. Ngongondo & T. Kanyerere	The use real-time model to fast track progress of water entitlements: Rethinking groundwater allocation reform in Southern Africa, Free State Province, South Africa	S. Maliano	Application of Multivariate Statistical Tools for Water Quality Analysis: A Case of Lilongwe River, Malawi	R. Kawondera & N. Chaukura	Sorptive remotion of caffeine from drinking water using engineered chicken eggshells and biochar			
14:30	R. Jani & E. Nyirenda	Catchment Characterization for Participatory Water Allocation Decision Modelling	K. Tadesse & M. Dinka	Seasonal Variability of Water Quality at Roodeplaas Dam, South Africa	A. Munyengabe, C. Zvinowanda, J. Ramontja & J.N. Zimba	Oxidation of iron (II) in synthetic acid mine drainage by sodium ferrate (VI) salt			
14:45	E.L. Mulder, H.C. Winsemius, V.C. Wright, S.C. Steele-Dunne & P.H.A.J.M. van Gelder	Droughts and decisions – Pastoralism, decision junctures and rain forecasting	N. Namafe, K. Mbata & F. Kleinscroth	Human Impacts on Water Quality of a Small Tropical Stream in Zambia	E. Mtonga, B. Thole & J. Kamanula	Assessment of waste separation and recycling systems in tourism lodges in Mzuzu City- Sustainability Indicators			
15:00	C.N. Pasipanodya & W. Nyabeze	Application of a dynamic water balance model to understand water security challenges: A case study of Kgetlengrivier Local Municipality	B. Setomba, O. Mogobe & W. Masamba	Assessment of water quality of the Lower Okavango Delta using NSF-WQI	M. Moila & M. Dinka	Determination of discharge coefficient for a weir flow			
15:15	N. Budaza, M. Aliber & J.M. Mwenge Kahinda	The contribution of small-scale fisheries to rural livelihoods: evidence from Hamburg, Eastern Cape province, South Africa	J. Nakanyala A. & N. Kgabi	Assessing the impact of Omaruru municipal dumpsite on groundwater within Omaruru River Basin	K.P. Gaboutoeloe, P.K. Kenabatho & B.P. Parida	Assessing the impacts of urbanization on water quality: The Case of Segoditshane River catchment in Gaborone City, Botswana			
15:30	N. Mangoale & N. Cooper	A socio-legal enquiry on the role of South Africa's CMAS in fostering decentralised water governance	H. Muhoyi, A. Mhizha, W. Gumindoga, S. Misi & N. Nondo	Investigating Surface Water Contamination for Catchment Protection: Lower Manyame River Subcatchment, Zimbabwe	M. Mangiza, F. Kayira & E. Wanda	Geochemical evolution of groundwater quality in Ngulube Area, Mzuzu City in Malawi			
16:00 – 16:15		Tea Break							
16:15	N.J. Shanono & J.G. Ndiritu	Impact of Human Behaviour on the Optimization of Reservoir System Operating Rules	M. Makonyela, M. Motsholapheko & R. Fynn	Local community engagement in the management of natural resources of the Okavango Delta, Botswana	J. Kushe, G. Ngulube & T. Tandwe	Intermittent Piped Water Supply and Microbial Level in Storage for Domestic Use in Mzimba Malawi			
16:30	T. Chitata, B. Sammie, V. Makuvaro, P. Mpofu, I. Chagonda, D. Munemo & B. Mudereri	What else does command agriculture do? Expropriating livelihoods, social capital and water governance	K. Sibanda, S. Ndlovu & M. Motsholapheko	Hydronyms of pools along Gweru River in the Silobela district of Zimbabwe as holistic indigenous knowledge (IK) for integrated water resources management	P. Kaponda, R. Holm, E. Mtonga & V. Kasulo	Household water treatment, an economic perspective: case of 2017/18 cholera patients in Karonga District, Malawi			

Water governance for sustainable, equitable and affordable water services		Water, Ecosystems and the Environment		Innovative approaches, practices and technologies for affordable water supply, and sanitation services		Open Special Session
16:45	N. Kenosi, Z. Hoko & W. Gumindoga	Investigating the management of Non-Revenue Water (NRW) for Gaborone City water distribution system in Botswana	G. Mukwishi, Z. Hoko & L. Mhlanga	Potential use of water hyacinth in pre-treatment of raw water from polluted sources for drinking purposes	M. Muloiwa, S. Nyende-Byakika & M. Dinka	Analysis of domestic water consumption in peri-urban South Africa: The Case study of Thohoyandou in Limpopo Province, South Africa
17:00	N. Sebusang & I. Basupi	Current Trends, Opportunities and Constraints of Household Water-Saving in Gaborone, Botswana	B.S. Senna & W.R.L. Masamba	Construction of a paper based analytical device for Fe(III) detection in Groundwater from the Central District of Botswana	Z. Nkuna, F.I. Mathivha & J. Odiyo	Water utilisation in South African higher education institutions: Case study of University of Venda
17:15	M. Motho, O.D. Kolawole, M.R. Motsholapheko & P.K. Mogomotsi	Effects of household demographic and socio-economic factors on water demand in Ngamiland District, Botswana	S. Winton, F. Kleinschroth, E. Calamita & J. Ghazoul	Reservoirs invaded by floating vegetation as hourglasses of the Anthropocene	K. Sikhwivhilu, J. Siame, S.S. Mutanga, L. Nematodzi, A. Simposya, F. Tshililo, G. Mwandila & L. Mukosha	Addressing the water-energy nexus in African cities for improving access to clean water for urban communities
17:30		WaterNet Alumni General Meeting Venue: Lecture Room 8				
18:30 – end		WaterNet Annual General Meeting Venue: Kgotla 1				

Friday 1 November 2019						
08:30 – 10:00	Open Special Session	Water, Ecosystems and the Environment	Innovative approaches, practices and technologies for affordable water supply, and sanitation services	Open Special Session		
	Venue: Lecture Room 7	Venue: Kgotla 1	Venue: Auditorium	Venue: Lecture Room 8		
	Chair: Dr. Hessel Winsemius Rapporteur: Ms. Petra Hulsman	Chair: Dr. Faides Mwale Rapporteur: Mr. Givemore Mukwishu	Chair: Dr. Claudious Chikozho Rapporteur: Mr. Ntungamili Kenosi	Chair: Dr. Jonathan Lautze Rapporteur: Ms. Ethel Mudenda		
08:00	<p>Prediction of hydrological processes in data scarce environments Special Session</p> <p><i>Convenor: IHE</i></p> <p>Programme:</p> <p>Hydrological modelling of the Luangwa Basin: improving the spatial pattern using satellite data: P. Hulsman, M. Hrachowitz & H.H.G. Savenije</p> <p>Low-cost, high accuracy Global Navigation Satellite System positioning for understanding floods: H. Winsemius, A. Krietemeyer, K. Van Dongen, I. Gayton, F. Annor, H. Samboko, C. Tiberius & N. Van de Giesen</p> <p>Evaluation of Photogrammetric Mapping Accuracy Based on Variation of Flying Altitude, Speed, Applications and Processing Software for Water Resources Management: H. Samboko, H. Winsemius, I. Abas & H. Savenije</p> <p>Estimation of River Discharge from Ungauged Rivers using the Pitman model: B. Nyikadzino & H. Makurira</p> <p>Influence of Miombo forest on land surface temperature: An assessment based on satellite earth observations:</p> <p>H. Zimba, M. Coenders, K. Banda, I. Nyambe, H. Savenije, H. Winsemius & S. Van Doorn</p> <p>Linking Local Knowledge to Larger Scale Meteorological Datasets to Support Flash Flood Warning in Northern Malawi: A. Bucherie, M. Werner, M. van den Homberg & A. Teklesadik</p>	J. Edokpayi, M. Nkhumeleni, A. Folami & J.O. Odiyo	Water Quality Assessment and Potential Ecological Risk of Heavy Metals in The Sediments of Some Selected Rivers Along Luvuvhu River Catchment in Vhembe District, South Africa	T. Nhubu, E. Muzenda & C. Mbohwa	Interrogating the nexus between water, soil and municipal solid waste management in and around Harare, Zimbabwe	<p>Operationalizing the Water-Energy-Food Nexus Special Session</p> <p><i>Convenor: International Water Management Institute</i></p> <p>Programme:</p> <p>Welcome and Session Aims: E. Mudenda</p> <p>DAFNE - A Decision Analytic Framework:for the Water-Energy-Food Nexus: J. Lautze</p> <p>An integrative WEF nexus model South Africa Case Study: S. Mpanдели</p> <p>Dams and water quality in the Zambezi:basin and the global tropics: S. Winton</p> <p>Operationalising the water-energy-food nexus: from theory to practice: L. Nhamo</p> <p>Panel Discussion: (Moderator J. Lautze)</p> <ul style="list-style-type: none"> • K. Banda (UNZA) • M. Tafadzwa (U KZN) • K. Jembere (GWP-SA) • D. Saruchera (IUCN) <p>Open Discussion: (Moderator: P. Mukuyu)</p>
08:15		T. Nkuna & J. Odiyo	Spatiotemporal variation and trends of aridity indices in the Luvuvhu River Catchment, South Africa	M. Mujuru, T. Mogashane & M. Johannes	Treatment of wastewater with the ROC process for the recovery of drinking water and saleable products	
08:30		B. Kuyakenge, M. Murry-Hudson, M. Gondwe, K. Mosimane & K. Mosepele	Microbial ecology associated with macrophytes in African wetlands - A review	C. Chikozho, D. Kadengye, M. Wamukoya, & B. Orindi	Leaving-No-One Behind? – Analysis of Trends in Access to Water and Sanitation Services for Nairobi’s Urban Slums, 2002-2015	
08:45		B. Mtengwana & T. Dube	Modelling the distribution of invasive alien plants in water-limited environments using multisource data	G. Mosse & J. Mutondo	Willingness to Pay for Water Supply Services in Rural Mozambique: Case Study of Sábie Administrative Post	
09:00		N. Musekiwa, S. Angombe, J. Kambatuku, T. Chitata & B.T. Mudereri	Does bush clearing method matter? Mechanical and chemical bush clearing is equally climate-unfriendly	P. Wamalwa & E. Nyaboke Atandi	Accelerating WASH universal coverage in remote rural village of Kenya: Lessons from Bartabwa AP Kenya, leaving no one behind	
09:15		G. Mokoena & M. Mthembu	Isolation of Sulphate-Reducing Bacteria from Coal Mine Wastewater and their Application in the treatment of Mine Effluent as Monoculture	Z. Msibi	Inclusive Water , Sanitation and Hygiene : The Case of Lubombo Cluster in World Vision Eswatini	
09:30		V. Uushona, M. Mathuthu & V. Indongo	Assessing the Radiological safety of underground water sources around a Uranium mine in Namibia	C. Mulopo & M. J Chimbari	Access to water sanitation and hygiene (WASH); and its influence on handwashing practices in rural KwaZulu-Natal	
09:45			Discussion	L. Sichone & W. Colenbrander	Adoption of Dry toilets as response to sanitation challenge for communities along Water Bodies	

Tea Break	
10:00 – 11:00	Adjudicators' Meeting Venue: Lecture Room 7 Chief Symposium Rapporteur and Session Rapporteurs' Meeting Venue: Lecture Room 8
Closing Plenary Director of Ceremonies: Ms Lebogang Mawelela Venue: Kgotla 1	
11:00	Strategic Plan for the Zambezi Watercourse (ZSP) - Sharing Prospects of a Newly Adopted Plan: Mr. Michael Mutale, ZAMCOM Executive Secretary
11:20	Remarks and Introduction of the International Scientific Committee and Team of Reviewers by the Chairperson of the International Scientific Committee: Prof. Masengo Ilunga
11:30	Overview of the 20th WaterNet/WARFSA/GWP-SA Symposium presentation by the Chief Symposium Rapporteur: Dr. Mangaliso Gondwe
11:50	Remarks by the Guest Editor of the Special Edition of the Journal of Physics and Chemistry of the Earth: Prof. Cosmo Socrates Ngongondo
12:10	Vote of Thanks: WaterNet Executive Manager, Prof. Jean-Marie Kileshye Onema
12:20	Announcements: LOC
12:30 – 14:00 Lunch	
14:00 – 17:00 Excursion	
18:30 – 22:00 Closing Gala Dinner Venue: Injabulo Room	

Poster Session

Venue: Kgotta 2	
Chair: Ms. Chetty Kershan Rapporteurs: Mr. Ernest Kanema & Ms. Ntanganedzeni Badana	
Water, Ecosystems and the Environment for Poster Presentation	
T. Dube & B. Mtengwana	Mapping the occurrence and distribution of invasive alien plants in Heuningnes catchment in the Western Cape, South Africa
J. Edokpayi, E. Makete & J. Odiyo	Evaluation of the potential of an agricultural waste (litchi seed) in the decontamination of Congo red from aqueous solution: Kinetic and Equilibrium studies
A. Mahowe & D. Mulungu	Assessment of Ecological and Hydrological impacts of Kamuzu Dams on flow regimes of Lilongwe River
M.R. Letsoalo	Simultaneous quantitative speciation of toxic elements in water using high-performance liquid chromatography hyphenated to inductively coupled plasma-mass spectrometry
P. Mahabeer & M. Tekere	Anthropogenic influences on the physical and chemical quality of water and sediments of the Umdloti River System, Kwazulu-Natal
A. Fataki & F. Mtalo	Assessment of Fluoride removal in groundwater by using magnesite: A case study of Arusha District, Tanzania
K. Okoko & F. Mtalo	Defluoridation of Drinking Water Using Raw and Calcinated Gypsum. The Case of Usa River, Arusha Region, Northern Tanzania
T.M. Mogashane, M. Mujuru & A. Ambushe	A Comparative study of polycyclic aromatic hydrocarbons in water samples from Mokolo and Blood Rivers in Limpopo river basin of South Africa
N. Hendricks, B.P. Gumbi & O.S. Olatunji	Development of analytical methods for detection of engineered nanomaterials in reclaimed wastewater
B. Nyikadzino, M. Chitakira & S. Muchuru	Rainfall trend analysis in the Limpopo River Basin using the Mann Kendall Statistic
N. Mhlarhi, W. M. Gitari, N.T. Tavengwa & W.B. Ayinde	Characterization and adsorption capacity of Citrus paradisi peel bio-sorbent for removal of selected metal species in aqueous solutions
D.J. Moises, N. Kgabi & E. Lewis	Developing a Contamination Susceptibility Index for Goreangab Dam in Namibia
G. Motsogi, A. Landman, A. Mulaba-Bafubiandi & X. Mbianda	Mirror face cleaning effluent as possible upstream contributor to the water table and municipality rivers pollutants
V. Ngwenya, K. Banda & I. Nyambe	Integrated ecological river health assessment based on water chemistry physical habitat quality and biological integrity
R. Gembo, C. King'Ondu & O. Aoyi	Photodegradation of Methylene blue using BiOBr _x 1-x Nanomaterials
L.S. Molele	Removal of Pb ²⁺ from contaminated water using modified multiwalled carbon nanotubes
D.P. Kgabi & A.A. Ambushe	Quantification and Thermo-desorption Studies of Mercury in Water and Sediments from Mokolo River, Limpopo Province, South Africa
S. Ramokgopa, K. Sikhwivhilu, K. Moothi & R. Moutloali	Thin film nanocomposite (tfn) membrane for heavy metal rejection from acid mine drainage

Changing hydro-climatic regimes and planning tools for climate resilient pathways	
B. Mudereri & T. Chitata	Multi-source remotely sensed data for water balance analysis in upper Runde catchment, Zimbabwe
S. Dzirekwa, W. Gumindoga, A. Mhizha, H Makurira & D. Rwasoka	Predicted Climate Change impacts on Surface water resources and allocation in a Semi-Arid Zimbabwean Catchment
B. Nyikadzino, M. Chitakira & S. Muchuru	Flood risk analysis in the Lower Limpopo River Basin using the Gumbel Distribution Method
T. Pfupa, W. Gumindoga & S. Misi	The impacts of Climate change on water quality in Lake Chivero and Lake Manyame, Zimbabwe
L.M. Waswa, A. Alexander & D.M.M. Mulungu	Assessment of Spatial Variability of Groundwater Potential and Levels. The Case of Moroto District, Uganda
R. Joseph & A. David	Developing a national telemetry groundwater monitoring network for Namibia
Water governance for sustainable, equitable and affordable water services	
R. Gondo, O.D. Kolawole, J. Mbaiwa & M. Motsholapheko	Demographic and socio-economic factors influencing water management in the Okavango Delta, Botswana
F. Pwiti	Climate-proofed Water Supply and Sanitation for Livingstone: Issues Affecting Gender Equity and Social Inclusion
A. Banda	Land Use Change and its Effects on the Livelihoods of Local Communities in the Barotse Floodplain
Innovative approaches, practices and technologies for affordable water supply, and sanitation services	
N. Ndebele	Assessment of the effect of longitudinal and seasonal variation of microbial water quality resultant from sand-filtering
T.B. Hera, W. Gumindoga & Z. Hoko	Remote sensing and GIS-based near real-time retrieval of water quality parameters for water abstraction, Lakes Chivero and Manyame
C. Chishala	Use of Artificial Neural Networks for Water Quality Prediction
M. Kalusa, J. Mchenga & W.E. Mtonga	Development of a Low-Cost Foot Operated Handwashing Facility
H. Mbiza, M. Scholz & S. Van Starden	Greywater Recycling System for Low Income Communities: Zandspruit case study, Johannesburg, South Africa
E.P. Munzhelele, W.M. Gitari & W.B. Ayinde	Synthesis, characterization of Fe/Ce doped poly-phenylenediamine composite and its potential adsorption evaluation for fluoride in groundwater
M. Tengtenga	Cement Sand Screed Technology
L. Nemadodzi, K. Sikhwivhilu, K. Jalama, M. Bambo, J. Siame & S. Mutanga	Direct water reclamation from treated municipal wastewater for potable reuse
Water, Land, Agriculture and Livelihoods	
B. Mudereri	Competing claims? Rapid expansion of growth centers diminish productive agricultural land in rural Zimbabwe
E. Magaia & R. Chilundzo	Maize leaf temperature as a tool for irrigation scheduling under semi-arid conditions
O. Moseki & L. Likoti	Sustainable land and water management in both lesotho and Botswana
U. Msovu, D.M.M. Mulungu, N. Joel & H. Mahoo	Land Use/Cover Change and their Impacts on Streamflow in Kikuletwa Catchment of Pangani River Basin, Tanzania

NB: Highlighted in grey are young water scientists

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