



**A COMPENDIUM OF THE
WATER RESILIENT CITIES LEARNING EVENTS
2018 - 2022**

ACKNOWLEDGEMENTS

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This Compendium is published by:

South African Cities Network
16th floor, Joburg Metro Building
158 Civic Boulevard
Braamfontein
Johannesburg, SOUTH AFRICA

PO Box 32160
2017 Braamfontein
Johannesburg, SOUTH AFRICA
(0)11 407 6471

info@sacities.net
www.sacities.net

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FOREWORD



With urban resilience taking centre stage, African cities are increasingly recognising the need to better understand water related risks. They are also beginning to explore innovative approaches that will enhance and enable their water systems to perform in volatile and unpredictable environments and optimise performance under foreseen and unforeseen changes.

It is in this context that in 2018, the Water Resilient Cities peer-to-peer knowledge sharing platform was established by the South African Cities Network (SACN), the South African Local Government Association (SALGA), the GIZ's Natural Resources Stewardship Programme (NatuReS) and the USAID's Water Sanitation and Hygiene Finance Program (WASH-FIN), with the support of varying partners over the past four years.

The platform was created to encourage and facilitate solution-seeking conversations and bring together key

stakeholders in the water sector, including city water managers, policy and decision makers, technical experts, practitioners, civil society and communities, around a common purpose.

Over the past four years, since 2018, five Water Resilient Cities Learning Events have been convened and have become catalysts for:

- ✔ engagement and effective peer-to-peer knowledge sharing among South African cities, across the Southern African region and beyond;
- ✔ solution-seeking conversations on innovative approaches;
- ✔ capacity strengthening amongst participating cities; and
- ✔ innovative responses to water security and resilience challenges.

Each event is guided by participant feedback (from city water managers and practitioners, water specialists in the public and private sectors, civil society organisations as well as regional and international experts) on topics that require further discussion, exploration and collaboration. This Compendium provides summaries of the learning events, the key insights and issues that emerged, the experiences of city water managers and practitioners

as well as recommendations from participants on what future events should focus on.

By documenting the lessons from the knowledge sharing platform and examining the practices, approaches, challenges and solutions put forward, the partners intend to contribute to transformative urban water resilience approaches on the continent.

THE PARTNERS



SACN: The South African Cities Network (SACN) is an established network of South African cities and partners that encourages the exchange of information, experience and best practice on urban development and city management. Working together with South African cities and partners through research, knowledge sharing, peer learning and innovation, the SACN is at the forefront of efforts to achieve the urban futures vision outlined in the Integrated Urban Development Framework (IUDF) and the National Development Plan (NDP).

The mandate of the SACN is to:

- ✓ Promote good governance and management in South African cities.
- ✓ Analyse strategic challenges facing South African cities, particularly in the context of global economic integration and national development challenges.
- ✓ Collect, collate, analyse, assess, disseminate, and apply the experience of large city government in a South African context; and
- ✓ Promote shared-learning partnerships between different spheres of government and all of society to support the management of South African cities.

SALGA: The South African Local Government Association is an autonomous association of all 257 South African municipalities, comprising of a national association, with one national office and nine provincial offices. Membership of the association is voluntary. SALGA has

set out its role to represent, promote and protect the interests of local governments and to raise the profile of local government, amongst other objectives. Since its establishment, SALGA has endeavoured to bring focus to its mandate of supporting local government transformation in a complex environment, characterised by a highly diverse membership-base of municipalities. SALGA has a clear strategic role to play in representing the interests of local government within the system of government as a whole and supporting its members to fulfil their developmental obligations.

GIZ NatuReS: The Natural Resources Stewardship Programme (NatuReS) enables private-public-civil society partnerships to sustainably manage the natural resources they need for improved livelihoods and continued economic development. The programme is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), which is a trusted partner within the international community of natural resource stewardship practitioners. An active supporter of governments and civil societies in protecting vital, natural resources from environmental threats, the programme also focuses on the added benefits of strong private-sector collaboration. NatuReS is currently active in Ethiopia, Tanzania, Uganda, Zambia and South Africa. This multi-donor programme is funded by the European Union, the German Ministry for Economic Cooperation and Development (BMZ), and the UK Foreign, Commonwealth & Development Office (FCDO).

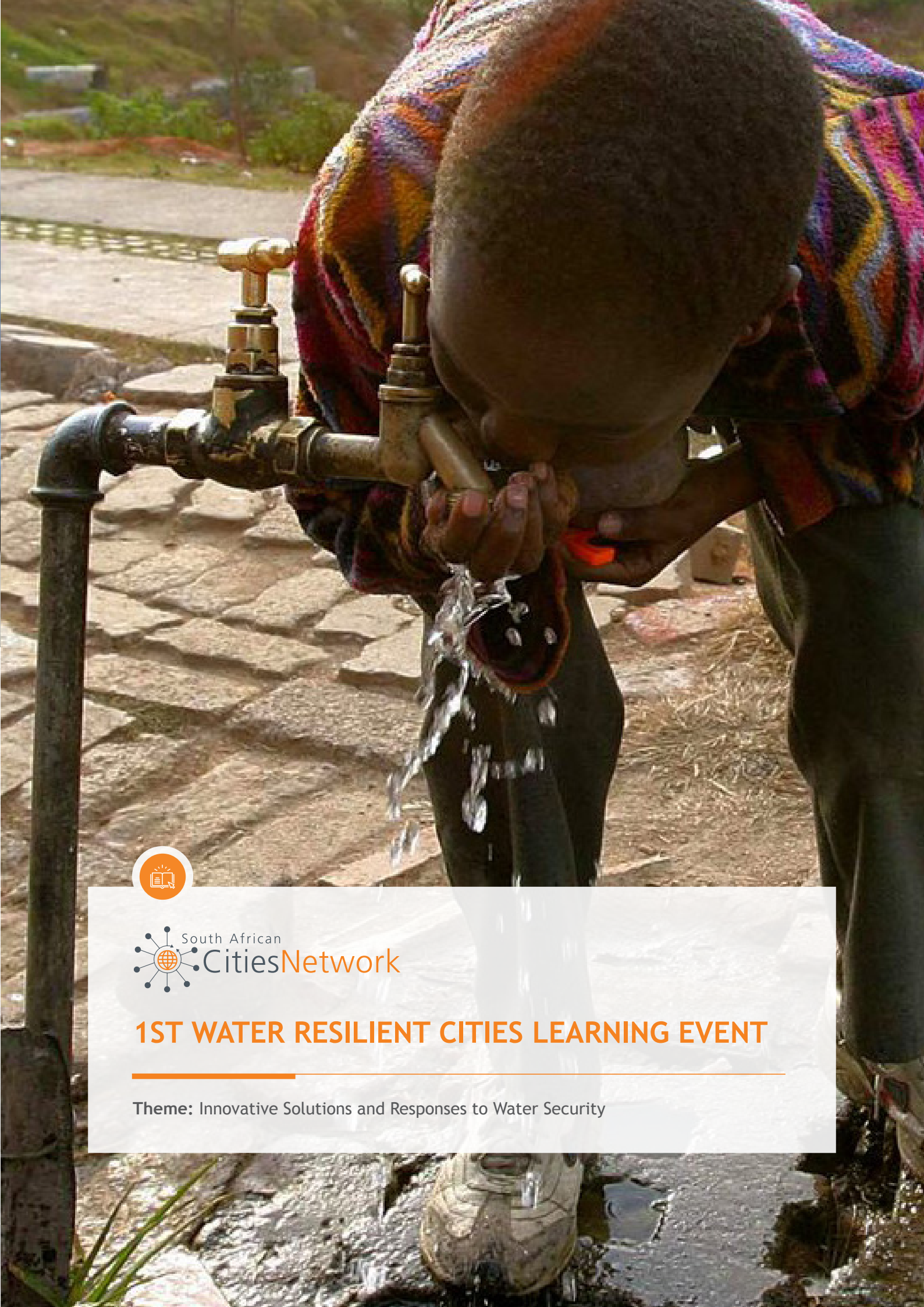


USAID WASH-FIN: The United States Agency for International Development (USAID) has a long history working with the Government of the Republic of South Africa in the water, sanitation, and hygiene (WASH) sector. USAID's Water, Sanitation and Hygiene Finance (WASH-FIN) Southern Africa program, which started in

July 2017, is a multi-year activity intended to reduce financing gaps to support universal access to water and sanitation services through sustainable and creditworthy business models, increased public funding, and expanded market finance for infrastructure investment.

PARTNERS AND ACKNOWLEDGEMENTS

-  Dr. Faith Lawrence - Country Coordinator: GIZ Natural Resources Stewardship Programme (NatuReS) South Africa
-  Amanda Nyingwa - Technical Advisor, GIZ Natural Resources Stewardship Programme (NatuReS)
-  Jonas Kertscher - Junior Advisor, GIZ Natural Resources Stewardship Programme
-  Chris Serjak - Team Leader, USAID WASHFIN Program
-  Meredith Kummings - Technical Advisor, USAID WASH-FIN Program
-  William Moraka - Head: Technology and Innovative Projects, South African Local Government Association (SALGA)
-  Mapule Letshwene, Knowledge Management & Innovation, South African Local Government Association (SALGA)
-  Sadhna Bhana - Programme Coordinator, South African Cities Network
-  Shaun Watson - Multimedia & Communications Specialist, South African Cities Network
-  Liteboho Makhele - Programme Manager: Sustainable and Resilient Cities, South African Cities Network



1ST WATER RESILIENT CITIES LEARNING EVENT

Theme: Innovative Solutions and Responses to Water Security

INTRODUCTION

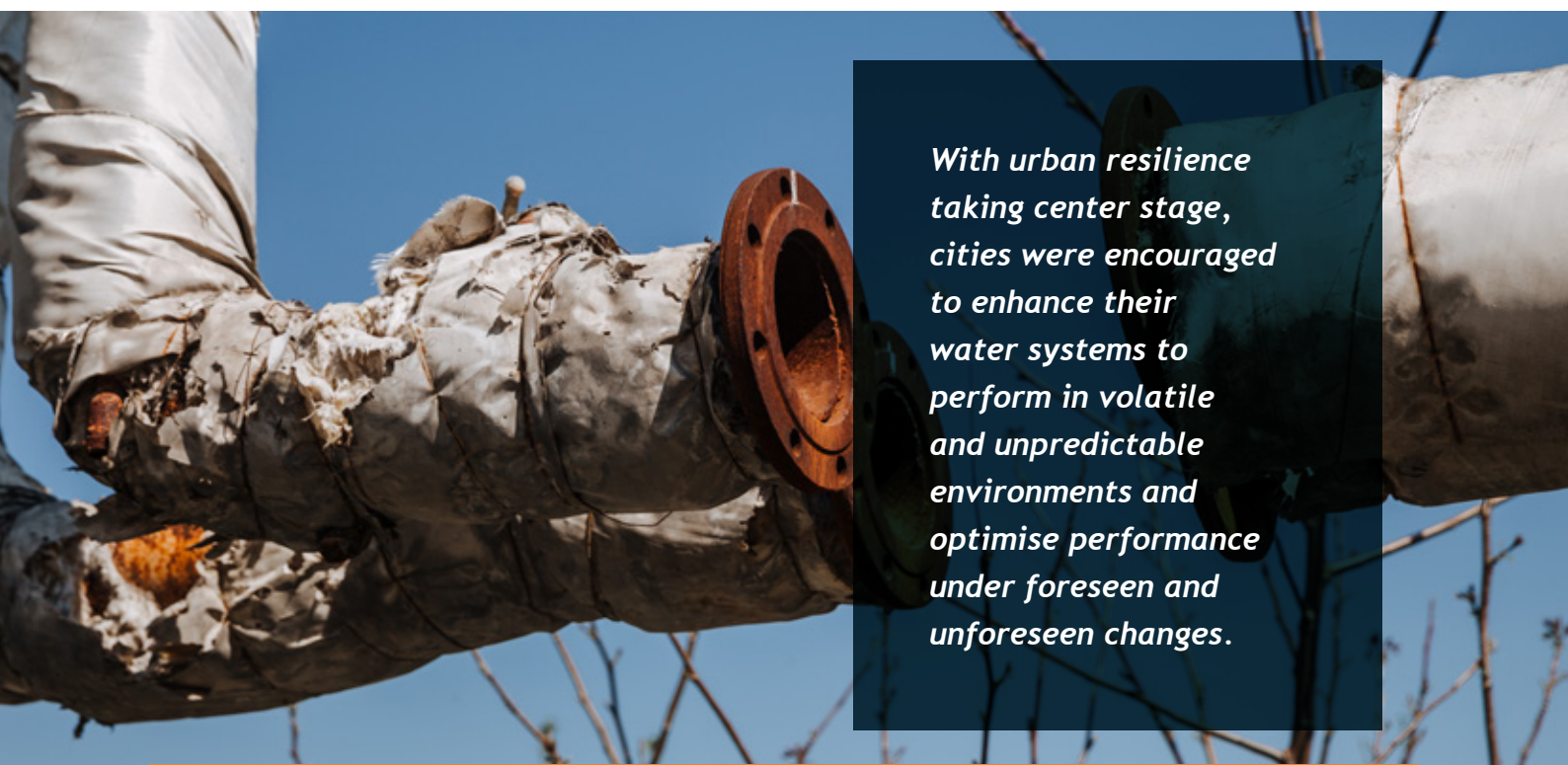


Water security is one of the biggest risks facing South Africa and the world in the 21st century. It presents a profound challenge to economic growth, social wellbeing and ecological integrity. Much of South Africa is severely water stressed, with current projections forecasting a supply-demand gap of 17% by 2030 and depletion of the country's economically viable land-based water resources by 2050 (World Bank, 2017). The drivers for this are many, including the semi-arid environment, a heavy reliance on water sources outside the country's borders and challenges in implementing the integrated water resource management legislative framework. In addition, escalated growth, rapid urbanisation, unsustainable water use, degradation of wetlands, municipal water losses and a decrease in rainfall due to climate change are increasingly putting the country under severe pressure to better prepare for and respond to shocks and stresses to its water system.

Addressing these challenges in urban centres requires building resilience not only in the cities' physical infrastructure but also in their social fabric, governance structures, financial systems and ecosystems that underpin the water sector. It also requires a practice-

based understanding of policy, the role of leadership and communication, governance, collective action and regulation as well as a deeper understanding of complexity management, especially at the city management level. In recognition of the need for holistic and integrated solutions to address water resilience in cities, the South African Cities Network (SACN) and the South African Local Government Association (SALGA) came together in 2018, with their partners, the GIZ's Natural Resources Stewardship Programme (NatuRes) and the USAID's Water, Sanitation and Hygiene Finance (WASH-FIN) Program to establish a peer-to-peer learning platform that convenes city officials policy and decision makers, experts, practitioners, civil society and communities who all have a role to play in making cities more water resilient.

To encourage and facilitate knowledge sharing through this platform, the partners have convened five learning events from July 2018, to March 2022. This Compendium highlights the key themes, provides summaries of the learning events, the key insights and issues that emerged, the experiences of city water managers and practitioners as well as recommendations from participants on what future events should focus on.



With urban resilience taking center stage, cities were encouraged to enhance their water systems to perform in volatile and unpredictable environments and optimise performance under foreseen and unforeseen changes.

1ST WATER RESILIENT CITIES LEARNING EVENT

Theme: Innovative Solutions and Responses to Water Security

Date: 11th - 12th July 2018

Venue: eThekweni Metropolitan Municipality

EVENT BACKGROUND

Given the water challenges in the urban context, a two-part learning event series (in July and November) was programmed to foster learning and identify solutions on water security and resilience in South African cities.

The July learning event took place from 11th - 12th July 2018 in eThekweni Metropolitan Municipality.

The purpose of the event was to encourage networking among participants and create a community of practice in water resilience. With urban resilience taking center stage, cities were encouraged to enhance their water systems to perform in volatile and unpredictable environments and optimise performance under foreseen and unforeseen changes.

The July learning event was designed to:

- ✓ Gain a better understanding of water security and resilience challenges faced by cities;
 - ✓ Explore innovative technical and financial solutions as well as responses to water security challenges;
 - ✓ Foster learning and networking on water systems and resilience;
 - ✓ Afford participants opportunities to establish partnerships and collaborations (a community of practice); and
 - ✓ Provide a platform for the sharing of national and international good practices and lessons.
- ✓ The November event was then designed to build on the outcomes of the first meeting and focus on concrete steps toward implementing new innovative responses to water scarcity in cities.



1. SETTING THE SCENE

1.1 Welcome and Opening Remarks

- ✓ *Mr. Ednick Msweli, Head of Water and Sanitation at eThekweni Metropolitan Municipality;*
- ✓ *Councillor Thami Ngubane, SALGA NEC Member & Chairperson for the Water and Sanitation National Working Group; and*
- ✓ *Ms. Sherry Zalika Sykes, U.S. Consulate General in Durban*

The event was opened by Mr. Ednick Msweli, Head of Water and Sanitation at eThekweni Metropolitan Municipality. eThekweni’s approach to dealing with water resilience was shared, together with details of the City’s ten-year plan and the different initiatives the municipality will be implementing to address water issues.

Additional opening remarks were delivered by Councillor Thami Ngubane, SALGA NEC Member & Chairperson for the Water and Sanitation National Working Group. Councillor Ngubane contextualised the importance and relevance of the event, citing research findings which indicate a 17% water deficit by 2030 if the current water demand projections persist in South Africa and how this situation threatens growth in cities as well as the country’s socio-economic development imperatives.

Ms. Sherry Zalika Sykes, United States Consular General in Durban acknowledged the many reasons there are challenges to providing water and noted that knowledge-sharing workshops are key opportunities and an important part of capacity strengthening among stakeholders.

1.2 Setting the Context for Water Security in Southern African Cities

Dr. Valerie Naidoo, Water Research Commission

Increased urbanisation has applied pressure for continued thinking around economic policies and how they drive demand. Continued growth will generate competing demands for water, and cause countries to experience

increased water stress, if they do not plan appropriately. Over time the context has changed in South Africa and there is a need to think about water security through the lens of climate change and drought. An emphasis should be placed on thinking about how research and data, when used well, can be effective in allowing for improved planning. The Water Research Commission is exploring ways of obtaining some of this data for improved modelling.

The presentation touched on the social components in South Africa, specifically the young population and the potential to encourage behaviour change and different consumption patterns, connect with communities around water interventions and consider the risks around water security in the future. The question posed was “*How can cities better connect with their citizens?*”.

Water security-focused approaches were discussed and included water sensitive design with emphasis on Water Sensitive Settlements (WSS), a concept based around four pillars:

- ✓ new water resources;
- ✓ water sensitive management;
- ✓ building resilience and governance; and
- ✓ maximum value from minimum resources.

The view was that consideration of these pillars and integration at the city level, holds potential for improving the situation around water challenges. In addition, the presentation covered surface and groundwater, water conservation, water demand and management, and desalination. Desalination was acknowledged as contentious and expensive, and that while there is a huge push for desalination, it should be looked at as one of many options. Meanwhile, the eThekweni Municipality was cited for pursuing new developments and driving sustainability. Examples included the engineering of wetlands to harvest rainwater and the testing of green roofs.



Concluding remarks emphasised: the importance of incorporating water security into spatial planning, the need to drive large water conservation and demand management programs in collaboration with communities, the private sector and large water users; the criticality of wastewater treatment with increased reuse; the concept that water security is not equal to disaster management; and the need to build water sustainability into systems.

1.3 Disaster Management - in the context of drought, floods and climate change - challenges and opportunities.

Jurgens Dyssel, National Disaster Management Centre

The presentation reviewed relevant legislation and policy around disaster management, noting that research has shown that for every \$1 invested in prevention, \$4 can be saved in responsive legislative obligations for regular review of disaster management plans. The main legislation that addresses disaster management in South Africa is the Disaster Management Act 57 of 2002. The Act provides for an integrated & coordinated disaster management policy that focuses on: preventing or reducing the risk of disasters; mitigating the severity of disasters; emergency preparedness; rapid and effective response to disasters; and post-disaster recovery and rehabilitation.

Challenges facing local government in dealing with the drought, and potential opportunities to address these issues and leverage the lessons learned were presented. Opportunities included, proactive planning that brings

together all stakeholders, ensuring prevention and mitigation measures, as well as emergency preparedness; acceleration of climate change adaptation and disaster risk reduction (DRR) measures; preservation and protection of ecological infrastructure; investing in DRR through climate risk approaches in buildings, agriculture, energy, etc.; and linking scientific knowledge with indigenous knowledge. It is not only a government approach to addressing the challenges but an all-of-society approach, which requires developing capacity to manage both the demand and supply side for water.

A key message was that in the end we all-of-society needs to work together to be water secure, and that there are some root issues to fix. Key systemic biases that require being overcome to ensure water security include: Myopia; Amnesia; Optimism; Inertia; Simplification; Overconfidence; Transference; and Aimlessness in terms of strategic approach. Amnesia, in particular, was emphasized throughout later sessions during the workshop.





Q&A SESSION: SUMMARY OF RELEVANT POINTS AND QUESTIONS

- ✓ There is a need to think through what a smart city is from a cities' resilience point of view. There are opportunities to bring people together on this but getting water resilience right is critical, and it should be seen not just as an input factor but an enabler. Here more research could also help.
- ✓ Identification of a catchment-based approach as a key element to be looked at collectively; albeit, challenges are noted about its effectiveness in driving ideas.
- ✓ Observation that there is a need for more foresight or analysis on water issues.
- ✓ Research around technological systems and indigenous studies exist. Ethnographic studies have indicated that people, even when they seem to have given up, can change their behaviour around water, can pay for water and conduct appropriate maintenance. However, a critical factor is the institutions. Behavior change is not easy but there is potential for younger generations, and this requires teaching sustainable development issues now.
- ✓ The challenge of 'amnesia' is real. In crisis there is an opportunity for change, how can this change be made and ensure it lasts without the amnesia slowly creeping up? Noted the importance of understanding when certain operating rules should come into effect.
- ✓ Social capital is critical and there is a real importance on appropriate and continuous engagement with communities.
- ✓ Questions circled around whether it is possible to speak about climate change for energy and water, and speak about economic development, and position water in this same way. In other words, that without water without water, economic development cannot be achieved.

2. MINI-PRESENTATION SERIES: THE IMPACT OF DROUGHT ON PROVINCIAL ECONOMIES - INPUTS FROM WESTERN CAPE AND KWA-ZULU NATAL

2.1 Economic Impacts & Response to the WesternCapeWaterCrisis

Helen Davies, Department of Economic Development and Tourism

The presentation contextualized the drought severity in the Western Cape graphically and provided a geographical update on the status looking at the extent to which urban water demand outstrips the sustainable supply. The message was that while the province had moved out of the danger zone there is still a long way to go and the economic impacts of the water crisis have been serious for certain sectors. Emphasis was put on the

need to understand the complexity of the economy and the need to look at the differences between businesses, as some have reduced productivity more than others. Economic impact modeling illustrates how GDP impact varies greatly by scenario and sector.

There has been a lot of work with businesses and provision of strategic guidance on taking appropriate action for drought response. The drought economic security workstream has been working in four main areas:

- ✓ reducing water consumption;
- ✓ building the water sector of the Province;
- ✓ preparing business for day zero; and
- ✓ increasing businesses' own water supply augmentation.

The economic security focused support helps provide information and raise awareness, guide strategic and technical support, and focuses on unblocking systemic issues to enable long term water resilience. Many businesses worked to reduce their water use and economic risks. However, a key issue is balancing economic and municipal needs and considering the impact on revenue collected by the municipality, as demand management plays a role in revenue generation. For medium to long term economic water resilience there is a need for continued business support at scale and public messaging on water saving and own water supply use to ensure sustained change. Improving certainty around key issues that drive investment decisions is important and includes: tariffs; regulatory issues surrounding groundwater; financing models; and decentralization.

2.2 Presentation: Drought in KZN: A Water Resource Perspective

Manisha Maharaj, Department of Water Affairs, KZN

A brief background on water resources and the drought was presented. It looked at drought mitigation through two approaches: demand reduction and supply increase. Demand management approaches discussed included pressure management, which was viewed as an easier option to take on first, internal leak repairs, and various

communication strategies (media, radio, tv, web, etc.). Under the supply increase approach, tankers were purchased and water tanks were installed, spring protection was put in place and boreholes were developed, and there were emergency transfer programs. Lessons learned through the drought were that timing and implementation of restrictions was critical.

2.3 Presentation: Innovative Solutions and Responses to Water Security Challenges

Bhavna Soni, eThekweni Metropolitan Municipality

A look at resilience - the ability to withstand or recover from setbacks and adapt to change - helped underline the interlinkages between the climate change adaptation and mitigation plan with the security of water supply plan and the WC and WDM plan. In the water conservation demand management plan - the sequence of what is done is critical, how it is implemented and monitored. Emphasis was placed on seven critical components of water supply security: water demand; water resources adequacy; infrastructure stability and availability; quality of water; management capacity; social and political factors; and financial sustainability.

The eThekweni response to water security has included a combination of innovative approaches and bulk projects. Bulk projects that have been implemented, those that are underway and those that need to be implemented were covered. The city is looking at a remix demonstration plan, which holds potential for system size increase. A groundwater feasibility study is being completed to gauge whether there are aquifers to tap. Direct and indirect reuse is being explored, including the reuse of effluent for golf courses and the like. Further, rainwater harvesting is considered for new building construction. The strategy over the next 20 years requires decisions on what will be converted to potable water, and what will be converted into second class water. The Northern and Western Aqueducts hold potential to provide water security for eThekweni for the next 30 years and are included in the largest aqueduct project ever managed by the city.

Meanwhile the municipality has also identified innovative approaches and technological solutions, including: pressure management; water management devices at consumer points; step tariffs as part of the demand management strategy; water restrictions during the drought; improved monitoring of reservoir levels and bulk meters; CAB for informal settlements; UD toilet provision as basic services in rural areas; and a plan to introduce flat rate to unmetered consumers by 2020. The presentation considered how to positively look at alternate ways of doing things and emphasized a one-step-at-a-time approach.

2.4 Presentation: Cape Town Water Outlook

Neil McLeod, Cities Support Programme, National Treasury

Cape Town has experienced an unprecedented multi-year drought with the past three years being the worst. One challenge faced by Cape Town was that the analysis around water has been based on data from 2004, meaning outdated data was used to make future projections, resulting in poor information and assumptions. Different interventions were employed to address the crisis. Demand management resulted in reduced demand within

the City, smaller surrounding towns and the agricultural sector adhering to the restrictions imposed on the system. Demand was managed down from 1200 to below 500 MI per day within a short period. Additional measures to reduce demand that were put in place include: punitive drought tariffs; demand management devices & flow restrictors; aggressive pressure management; and accelerated leak detection and repairs. Communication has been hugely critical. In the beginning of the crisis, there was very limited communication, and this was a significant shortcoming. It was noted that there was a rush to investigate desalination, but the realization was that it is very complex and expensive.

The City of Cape Town augmentation plans include prioritization of groundwater extraction, permanent desalination exploration, water reuse and further surface water augmentation. It was noted that water security in Cape Town from now onwards, requires looking at both the supply and demand sides of the equation. On the supply side the following need to be considered: updated hydrology (reduction in system yield); revisiting allocations; revising augmentation; and confirming inter-governmental roles and responsibilities. On the Demand side: continued efforts around demand management, approach to a water sensitive city and adaptation are key considerations.



3. PANEL DISCUSSION: CITIES' RESILIENCE STRATEGIES AND APPROACHES - FOCUSING ON ALLOCATION, DROUGHT, TECHNOLOGY AND INNOVATION

Helen Davies, Bhavna Soni, Neil McLeod, Manisha Maharaj

The following points were put forward:

- ✔ Question on water tariffs in South Africa and understanding the full cost. Discussion focused on the structure of the tariffs as being an issue and a need for them to be welfare maximizing. It is essential for municipalities to consider this in their tariff structure, so that they do not penalize the poor. Each municipality sets its own pricing and tariffs.
 - ✔ Discussion around how the grant funding will look with a realization that there is more demand on the fiscus.
 - ✔ There is an identified need for capacity development for developing projects suited for borrowing.
 - ✔ Question on the challenge with capacity in cities and who the decision makers are at the municipal level.
 - ✔ Questions around integrated planning, how can it be linked to IDPs and budgets and the role partners can play in planning and building decision making capacity.
 - ✔ One glaring aspect between different provinces is the existence of water boards and the role (if any) they played in how droughts were managed in those places.
- ✔ There is a realization that restrictions are approaching. Question on whether it would be helpful to have a national standard.
 - ✔ Acknowledgement that it could take 10 years to reduce NRW by 20%; however, there is interest in exploring a process where dealing with NRW becomes a national program. In reality, NRW is unlikely to drop in a short period of time.
 - ✔ Discussion on how councils have been convinced to accept different approaches. One response was that where water conservation management was implemented the municipalities were in the middle of the drought, thus the timing was good. That made it easily acceptable, and while the cost was an issue, it was planned for completion over a 10-year timeframe.
 - ✔ Discussion on what worked and did not work for businesses. Communication did not work well and there were mixed messages, but there was an effective effort to switch this around. There was no governance system to manage the inflow of offers to deal with the crisis. Technical support to businesses worked well, as they were able to build good work stream partnerships with businesses and municipalities.

4. BREAKAWAY SESSIONS

4.1 Breakaway Session 1: Non-Revenue Water

Rheenie Mbatha, City of uMhlathuze; Allestair Wensley, Department of Water and Sanitation; and Mthokozisi Ncube, Development Bank of Southern Africa, William Moraka, SALGA

This session provided an overview of Non-Revenue Water (NRW) challenges in South Africa and highlighted the regression that has been observed in terms of NRW. Perspectives were shared from the City of uMhlathuze, the Department of Water and Sanitation and the Development

Bank of Southern Africa. The City of uMhlathuze shared its short-term and long-term interventions related to water savings. It noted the 2010 introduction of pressure reducing valves as a solution to saving water and reduction of burst pipes. Short-term interventions have included the repair and placement of valves for proper isolation during water shedding; installation of data loggers to monitor and manage water demand; leak detection and meter auditing; water awareness campaigns; and implementation of level three restrictions and drought tariffs. Meanwhile, long-term interventions include: looking at PPP project mechanisms on water reuse; exploration of PPP project for a desalination plant; and the Tugela transfer scheme, which is under construction.

The National Department of Water and Sanitation discussed key actions it was taking and the municipal context in which it operates. It was noted that data quality is improving but the number of datasets is reducing, and that improved analysis and interventions have not significantly changed the key performance indicators over the past five to ten years. National NRW is 41 percent, and the question remains what the realistic performance benchmarks are for the different municipalities. A way forward highlighted: political buy-in and support being key; the importance of municipalities developing and implementing WC/WDM strategies and improving efforts to reduce NRW; the need to adhere to water loss targets; proper resources for municipal WC/WDM programs; continued DWS training; DWS roll out of No Drop incentive-based regulation; and DWS continued monitoring and reporting of performance.

The Development Bank of Southern Africa shared key considerations to be factored into any WCDM initiative for improving sustainability. It was highlighted that pipe replacement programmes do not always result in water savings, and that there is a need for planning and implementation in tandem with other initiatives. The timing on repair of water leaks was noted as a critical determinant for water loss and was underlined by the need to consider maintenance issues. Strengthening institutional structures and the ownership of WCDM at appropriate strategic and operational levels was a key priority. Life-cycle costs and impacts of (new) WCDM assets need to be factored in from the beginning.

Performance based contracting for WCDM has been proven and can incentivize correct behaviors. This prompted a look at the DBSA Water Conservation, Demand Management & Cost Recovery Product, which embraces a holistic, programmatic, phased municipal wide approach to the WCDM planning and implementation. It takes the form of an alternative financing mechanism to traditional balance sheet finance and off-balance sheet project finance through a hybrid model. Future advancement for addressing NRW was categorized under five pillars, including: 1) Institutional; 2) Financial; 3) Social; 4) Technical; and 5) Technology and innovation.

4.2 Breakaway Session 2: Financing infrastructure and innovation

Jeremy Gorelick, USAID WASH-FIN, and Johann Lübbe, Development Bank of Southern Africa (DBSA)

The breakaway session focused on topics relevant for municipalities to consider for securing appropriate and cost-effective financing for critical water and sanitation infrastructure projects. It covered the importance of long-term capital investment planning for essential infrastructure projects. The discussion pushed the need to think past temporal planning and consider financing that could match the useful life of an asset. Municipal funding sources for infrastructure were looked at, with an angle on how municipal money or own source revenues could be used more strategically. Attention was placed on how municipalities can signal their interest in borrowing to a wider audience of lenders, and the benefits of being creditworthy and what can be offered through a credit rating.

A look at the municipal infrastructure landscape and financing environment highlighted the potential of increased urbanization in terms of driving growth and the challenges this presents. When looking at debt in the country it was noted that a large percent lies in the main metros, and there has been a decline in borrowing from intermediate cities. Discussion touched on the technical capacity challenges in terms of access to appropriate technical transaction support, and ability to cover the necessary feasibility studies and analyses. At the same time, the presentation noted the well-developed financial sector in South Africa that was available for municipal

infrastructure finance. It looked at the challenges preventing private capital from investing in municipal infrastructure. The concept of credit enhancements was discussed by DBSA, which also framed how to help crowd-in the private sector, and the role the sector can play to catalyze infrastructure in general. DBSA explained its strategic shift and five-pronged strategy for impact: project preparation; new infrastructure programmes; product innovation, embracing new funding structures;

maintenance of public infrastructure; and partnerships. The project preparation assistance was an item followed up on in participant discussions. Should a similar session be included in a future workshop that includes participants from outside of South Africa, special attention should be paid to thinking about the nature of financing in other countries that may differ significantly from the South African model.



Summary of Presentations on African Cities and Group Discussions

1. INTRODUCTION

Dr. Faith Lawrence, GIZ/IWASP and Mr. John Groarke, USAID Southern Africa

The second day of the event focused on experiences in African cities and fostering dialogue from participants on what had been learnt over the course of the two days. Dr. Faith Lawrence opened the event, and her introduction was followed by a recap of the two breakaway sessions from the preceding day. John Groarke then spoke on the importance of learning across boundaries to set the scene for the two speakers sharing presentations on African city experiences.

2. AFRICAN CITY EXPERIENCES

Presentation: Mitigation Through Innovation: Sustainable Water Supply in Windhoek, Namibia

Pierre van Rensburg, Urban & Transport Planning, City Windhoek, Namibia

The recent drought experience in Namibia was provided and complemented by earlier history on how the water systems have developed over time. Windhoek is often referenced as a model case for dealing with water scarcity, due, in particular, to its developed reuse program. Albeit, it was acknowledged that a lot of the challenges identified in South Africa were also faced in Namibia, such as the amnesia effect. At the same time, it was noted that the context is different in Windhoek, which is a much smaller city than Cape Town. Further, Windhoek has always been water stressed. Over recent years climatic changes have had an impact, with warmer temperatures predicted, increased rainfall frequency but

declining overall quantity of rainfall, and projections on increased evaporation.

For Windhoek, every time a drought is experienced, water demand management practices are enforced, yet the demand has continued to increase over time. In 2015, the most recent drought across the region, a drought response plan was developed which helped to classify the level of drought as well as indicated what should be conveyed to users to incentivize appropriate responses. In this context, the drought response plan takes a holistic approach to water management. A CA-Model is employed to determine water scarcity severity indicators and this links to the demand management index. Depending on what tier the city falls in, there are recommendations for different efforts and what people are allowed or not allowed to do given the situation. The city employs weekly tracking on savings and tries to give people regular feedback every week through various means of communication - this has proven useful.

Learnings from the Windhoek experience was that demand response is something that needs to be continuous and this entails helping people understand that they need to save through open and tailored information flows. The public will only save water as long as they perceive a need to save. Continuous communication and awareness helps maintain momentum.

Primary strategies employed to address their challenges include:

- ✓ non-potable reuse;
- ✓ aquifers; and
- ✓ direct potable reuse.

Windhoek has explored viable alternatives for water resources, including non-potable reuse, and have built out old potable water systems, which now service irrigation systems, public parks, etc. with a defined tariff and limits on what to maintain. The city manages an aquifer recharge scheme, where water is stored underground when there is sufficient amount and is tapped when water is running low. They also have direct potable reuse. However, it was noted that this system was developed a long time ago, and that is part of the reason for the acceptance.

The final part of the presentation illustrated the difference between water supply prior to drought and during drought. Under drought there is a severe reduction in surface water and an increase in aquifers and potable reuse, and minor increase in non-potable reuse.

The main Windhoek principles include

- ✔ only use water from domestic origin, and thus maintain consistent quality;
- ✔ monitor from the point of discharge all the way to the tap, to ensure they know what is going on everywhere;
- ✔ effective biological treatment;
- ✔ multiple barrier treatment;
- ✔ blending of final effluent; and
- ✔ continuous education and communication for the public to ensure strong public confidence and response.

3. PRESENTATION: GOVERNANCE BOTTLENECKS AND OPPORTUNITIES FOR REDUCING NRW

Nick Tandi, Strategic Water Partners Network

The presentation examined a broad study that covered NRW across five countries in Africa and considered both the massive financing gap for infrastructure and the sizeable cost of NRW. There was an emphasis on the

need to consider the institutional framework for water governance, and when looking at supply and demand of water, to think about the different institutions that are playing a role in conducting these assessments.

It can be hard to translate NRW targets into something that is meaningful. While it is an important indicator of the health of a service, it should not be the sole focus, as that will not necessarily reinforce sustainability. There is a need for connection to some systematic change, and there is an incentive to think about strategic management. Reaching out to the private sector is something to consider but experience across Africa with the private sector has varied.

The presentation ended with observations coming out of a World Bank study looking at why some utilities in Africa are doing well and have persevered, in spite of desperate situations. Three drivers identified include:

- ✔ the water service provider has a strong and capable manager;
- ✔ there is stable political support; and
- ✔ there was an ability to capitalize on a notable event (i.e. disaster, etc.).

Noted challenges, are that once this change is created and proves to generate a healthy cash flow, there is then a higher risk of other issues, and creativity is therefore needed to protect those cash flows. Two sustainers of progress include:

- ✔ strong coalitions that have power over politicians; and
- ✔ third party facilitation.

Questions and points that came up included questions around the water balance, and observations that people have yet to come across a water balance that is credible.

PARTICIPANT ROUND TABLE DISCUSSIONS

A group exercise using guiding questions was arranged to encourage learning and dialogue amongst participants. Participants organised in small working groups for discussions.

Group conversations covered a series of concerns, including:

- ✓ instability within municipalities and institutional memory limitations;
- ✓ not investing now will result in a higher price to pay later on;
- ✓ water theft is a significant issue not sufficiently addressed;
- ✓ the limitation of resources on both a human and financial level;
- ✓ municipalities not allocating sufficient funds for the water budget;
- ✓ lack of bankable proposals;
- ✓ noted flaws in modeling due often to not having the information or right information, so data is easily disputable. What can be done to help this?

Participants acknowledged the need for introspection. Municipalities need to assess their creditworthiness to be able to know where they stand. Municipalities are required to have a water management plan but there needs to be a better way to align sectors in the municipality for implementation of the plan. One worry is that solutions by technical experts has been varied - no one is speaking the same language about what should be done. As a result, this takes away from a consultative national solution. Meanwhile, the role of water boards was contemplated, with some discussants of the opinion that they are not working well, and others of the perspective that they may need to simplify the structure, and that opportunity still exists.

A pressing issue raised concerned how to make water a priority at the national level outside of a crisis. Behavioral changes are prompted by a crisis but as that subsides, there is a return to previous practices. The question is therefore: How can the impact of not having water be quantified? This proves challenging but could help in illustrating the economic challenges and how they fit with the social dimensions. Thinking around economic development potential is important because businesses cannot bounce back as fast as an individual household, and this can have an impact on the national fiscus.



PARTICIPANT RECOMMENDATIONS FOR NEXT EVENT

Participants at the workshop provided the following recommendations for topics to be explored further at the next planned event. A summary of the recommendations is provided here.

Please note: These recommendations were provided at the end of the second day, and thus, reflect submission from a small participant pool due to the attrition that took place.

- ✔ **Economic impact of drought** - Presenters and participants highlighted the importance of better understanding the economic impact of droughts and suggested further action to look at how to scale up studies around the impact on local economies.
- ✔ **Financing for infrastructure delivery** - Identification of more examples of municipalities obtaining finance for infrastructure project implementation and discussions on exactly how this was accomplished. Discussions could include how the municipalities received development finance/private sector funding, with lessons on how projects were prioritized, packaged and prepared for funding.
- ✔ **Additional participants** - Interest in having greater representation from municipalities, National Treasury and other National government departments (beyond DWS and CSP).
- ✔ **NRW deep dive** - Conversations were spurred around how to develop approaches for NRW projects, and interest in more hands-on support was noted. One request was for the sharing of case studies on how some municipalities have reduced NRW, to better understand what worked and did not work, including examples of how PPPs have been used. Additional research around local and international non-revenue water examples could be helpful.
- ✔ **Reuse deep dive** - Interest in understanding how to approach scaling of water reuse across the country, where it has already been achieved and the context of how, and other ways of introducing water reuse programs.
- ✔ **Groundwater deep dive** - Taking a deeper look at groundwater as a potential source.
- ✔ **Climate change** - Participation from more experts on climate change and hydrological data collection.
- ✔ **Water Boards** - Multiple perspectives around water boards resulted in further requests for consideration in the next event. This could include a presentation by water boards describing their functions and explaining how they work and why they exist.
- ✔ **Improved connections** - Participants noted the benefits of improved connections for people/stakeholders in the water sphere, on all levels, as a way to develop cooperation.
- ✔ **Greater municipality participation** - There was repeated assertions that more municipalities need to be present, and there should be increased sharing on experiences through examples of challenges experienced by different municipalities, and solutions identified. One specific idea would be for South African municipalities to bring their problems / challenges to present in front of a panel of experts to get technical advice. In addition, municipalities could bring a case study on their own experiences to be shared with the larger group and allow peer to peer support.



KEY HIGHLIGHTS

Addressing challenges to water security requires planning appropriately by leveraging strong research and data. Up-to-date and accurate data is important to monitor water use and predict future issues, and respond appropriately, while also being able to communicate the situation to the public, which is critical for ensuring proper buy-in and support. However, data availability and quality are a challenge.

Demand response is something that needs to be continuous and this entails helping people understand that they need to save water. A drought response plan can help classify the level of drought, and indicate what should be conveyed to users, to incentivize appropriate responses.

Collaboration is key to be water secure. However, a challenge is that there is a tendency to work in silos. Economic impacts of the water crisis have been serious for certain sectors and underline the need to better understand how to balance demand management and the economic implications on revenue collection. Reduction of water revenue has a direct impact on funding of water infrastructure, and these are some of the challenges that require management.

Identified systemic biases that need to be overcome to ensure water security include: Myopia; Amnesia; Optimism;

Inertia; Simplification; Overconfidence; Transference; and Aimlessness in terms of strategic approach. Amnesia was a recurring theme in the presentations. Where following a crisis it has been observed that people easily fall back to business-as-usual, resulting in continuation of interim solution planning.

Long-term capital investment planning is critical for infrastructure projects. There is a need to think past temporal planning and consider financing that could match the useful life of an asset.




















Building water sustainability into systems and taking a holistic approach to address water scarcity is valuable. It is important to consider all options to identify what works for individual contexts and not just prescribe one solution.

There are major Non-Revenue Water (NRW) challenges in South Africa and it was highlighted that there has been a regression over time. Five pillars were identified as a way forward during the discussion, including:

- ✓ Institutional;
- ✓ Financial;
- ✓ Social;
- ✓ Technical; and
- ✓ Technology and innovation.

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-  Ednick Msweli, Head of Water and Sanitation at eThekweni Metropolitan Municipality;
-  Councillor Thami Ngubane, SALGA NEC Member & Chairperson for the Water and Sanitation National Working Group; and
-  Sherry Zalika Sykes, U.S. Consulate General in Durban
-  Dr. Valerie Naidoo, Water Research Commission
-  Jurgens Dyssel, National Disaster Management Centre
-  Helen Davies, Department of Economic Development and Tourism - Western Cape Provincial Government
-  Manisha Maharaj, Department of Water Affairs, KZN
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-  Johann Lübbe, Development Bank of Southern Africa (DBSA)
-  Dr. Faith Lawrence, GIZ/IWASP
-  John Groarke, USAID Southern Africa
-  Pierre van Rensburg, Urban & Transport Planning, City Windhoek, Namibia
-  Nick Tandi, Strategic Water Partners Network

PARTNER ORGANISATIONS FOR THIS 1ST WATER RESILIENT CITIES EVENT

THE PARTNERS





2ND WATER RESILIENT CITIES LEARNING EVENT

Theme: Improving water resilience and financing the needed investments



The event also showcased a variety of alternative approaches to manage water resources and improve service management that have inspired municipalities to further pursue water resilience.

2ND WATER RESILIENT CITIES LEARNING EVENT

Theme: Improving water resilience and financing the needed investments

Date: 18th-19th March 2019

Venue: City of Cape Town Metropolitan Municipality

INTRODUCTION

The second Water Resilient Cities Learning Event, that took place in Cape Town from 18th–19th March 2019, provided participants with proven tools for improving water resilience and financing the needed investments. The event also showcased a variety of alternative approaches to manage water resources and improve service management that have inspired municipalities to further pursue water resilience.

1.1 BACKGROUND

In the first Learning Event held in Durban in July 2018 under the theme of “a toolbox of proven measures to achieve water security” participants learned how economic development and increased urbanisation have driven increases in the demand for water, while at the same time, supplies have been threatened or disrupted due to drought, water pollution, over extraction, and water loss. These challenges are exacerbated by a lack of research and data as well as the tendency of amnesia once a crisis, such as a drought, has passed. Several presentations highlighted that the economic impact of water shortages has been felt throughout South Africa, especially during significant droughts faced in recent years by Western Cape, Eastern Cape, Kwazulu-Natal, and Gauteng. African best practice examples were also explored with considerable interest expressed in the experience of similarly challenged African Cities.

As mitigation for these challenges, participants learned about efforts to reduce non-revenue water, examples of water resilience measures undertaken by the City of Windhoek in Namibia, and explored issues around



financing the investments needed to improve water resilience. Finally, the participants held a panel discussion that highlighted challenges to water resilience at both the local and national political levels. However, there was consensus that a failure to invest in resilience now would result in a high price to pay in the future.

At the end of the event, participants were polled for recommendations of topics to include in the second Learning Event. Participants sought to learn more about implementing specific measures to improve resilience such as non-revenue water loss reduction, groundwater extraction, and water reuse. Participants also wanted to learn more about financing infrastructure delivery. Finally, participants wanted to see greater representation of municipalities and national agencies.

1.2 OBJECTIVES

The first Water Resilient Cities Learning Event set the stage and introduced participants to a wide range of

challenges and opportunities. The second Learning Event built on the outcomes of the first meeting as well as participant recommendations and focused on concrete steps toward implementing new innovative responses to water scarcity.

It was intended that this Second Learning Event provided participants with a “toolbox” of proven measures for:

- ✓ improving water resilience in municipalities and
- ✓ increasing investment in water resilience.

Participants were also introduced to a wide range of partners, programs, projects and approaches offering learning to foster water resilience initiatives. To ensure a more inclusive discussion and engage decision-makers and policymakers a broader set of municipalities as well as representatives from the department of Water and Sanitation and financial service providers were invited.



2. OPENING SESSION

2.1 WELCOMING REMARKS

Councillor Thami Ngubane, SALGA NEC Member & chairperson for the Water and Sanitation National Working Group;

John Goarke, USAID regional head of mission,

Godje Bialloch head of the GIZ Governance support programme, representing the GIZ Country Director;

Liteboho Makhele South Africa City Network Programme Manager Sustainable cities.

The programme was opened by Councillor Ngubane who contextualised the Water Resilient Cities Learning event in the theme of the water week “water for all” and called on the important role of cities in the achievement of this objective. He shared significant examples of water challenges experienced by municipalities and highlighted the importance of further exploring innovation and encouraging cross-learning among cities and municipalities. He also emphasised the need to deepen municipalities’ understanding of climate change and shared SALGA’s work related to the Master Plan for Water and Sanitation as well as its efforts to reduce water losses.

Additional remarks were delivered by the partners, namely John Goarke (USAID), who congratulated Cape Town for its boldness and creativity in managing the water crisis and renewed USAID commitments to supporting the water sector. Godje Bialloch (GIZ) followed, by highlighting the importance of joint action from private sector, public sector and civil society to tackle shared water risks and the renewed commitment of the German Development Cooperation towards supporting water in South Africa.

Liteboho Makhele (SACN), concluded the welcoming remarks by conveying the support of Mr Sithole Mbanga, CEO of the South Africa Cities Network and emphasising their contribution as an organisation encouraging knowledge dissemination across municipalities.

2.2 SETTING THE SCENE

Kevin Winter, Professor at the University of Cape Town

Professor Kevin Winters gave the key note address at the learning event. During his presentation he stated that the concept of Resilient Cities can be flawed unless supported by the knowledge of what to measure and assess and why (a source to deepen the understanding of the concept if: “from resilience to resourcefulness: A critique of resilience policy and activism” for more information). The concept of resilience has been transposed from science into social science and refers to the capacity of a system to bounce back after a shock. In the social science context, city resilience could be demonstrated by its capacity to become responsive to enable disadvantaged groups ‘to access levers of social change’ and bridging its divides. He argued that Cities are leaders of change and the state will follow. Cities are a key contributor to water and environmental problems as well of part of their solutions. Currently 63% of SA is urbanised and 80% of economic activities happens in cities. By 2030 over 70% people will be living in urban areas and unemployment among the youth is estimated to be at 35.7%. This picture points towards a gloomy future where urban areas will be more congested, polluted and more socially fractious. This will be likely unless key principles from the Climate of Hope (Bloomberg & Pope 2017) are adopted. Those principles start from the realisation that Cities are the key to saving the planet and that a bigger focus on things that make cities better, cleaner, healthier, and more economically productive places which also reduce carbon emissions.

Citizen should not be scared off but rather energized by the immediate benefit of joint action. To enable citizens to act, it is essential to capacitate and inspire a new generation to act differently. Young people are key and should be educated and empowered accordingly. The water and sanitation sector should make itself attractive to inspire the new generation and find solutions which are different. Education should also integrate and value

a combined approach of engineering and social science to solving water problems.

Building resourceful, sustainable and responsive cities requires working with the concept of the city as a catchment. Measures to ensure that the city becomes more water sensitive whereby water availability, water quality, amenity value and ecology systems together can enhance the health of the city must draw water into the cities' fabric. Some examples are the work of Singapore's Public Utility Board acting on the slogan of conserving, valuing and enjoying water. Enjoyment of water should be reintroduced when discussing solving current water issues. Other examples are the Educto initiative in Mexico City. In South Africa the Water hub in Franschhoek is currently busy rethinking the relationship between water and cities. As South Africa needs R30b from now until 2030 to avoid a 17% shortfall in water supply, the only possible way forward is to follow Greta Thunberg's advice and start acting in reaction to the panic caused by the situation.

2.3 KEYNOTE ADDRESS

Gugile Nkwinti, Minister of Water and Sanitation

The Minister's keynote address highlighted that municipal responsibilities are often not reflected in their budgetary processes. National government on the other hand needs bulk infrastructure to provide adequate water services and sanitation. Citizen action and attitude remains key to solving South African Water issues including the increasing challenge of vandalism. The minister noted that mention was made by a preceding speaker of Makhanda, which was his home town. Personally, he did not realise it would run out of water, especially since it had three rivers originating from Makhanda. Despite this water source asset, Grahamstown is out of water. This remained a concern. Climate change and population growth are leading to a crisis of the success of the democratic project of South Africa. As a country we failed to increase much needed service delivery, and this was exacerbated by sanitation provision failures especially in rural areas. It was not unusual that rivers were affected by human waste and in turn this affected water provision. He noted a meeting with all DGs of provinces would take place so that he could be advised on how water will be allocated

across provinces. He recognised that limited funding and rampant corruption remained serious issues plaguing water provisioning. In explaining how the system worked, he stressed that national government constructed bulk infrastructure while municipalities received 9% of the total budgetary allocation. While this remained limited, they were also responsible for regulation provision. It was clear that resource availability was insufficient to meet national needs. There were ongoing discussions to bring it into the DWS mandate out of necessity. Even with a dam - water is not always available to communities - so vandalism occurs. The Minister emphasised that the time has come to think differently and act differently with regard to water resources. Reflecting on local examples he stressed that Clan William dam for example was to be raised, but water supply and resources were obstacles. Another example was that rural communities did not always make the link between waste water and reuse systems.

The Minister agreed with Dr Kevin Winter that there is plan after plan but no implementation. Many droughts have already occurred, but they have not yet served as a wakeup call provoking a change in thinking and "act as if the house was on fire". Understanding around water should be fostered and together with raising dam walls as well as other actions such as reclamation and recycling should be encouraged. Social scientists together with engineers should support the planning. His speech concluded with the announcement of the cooperation between DWS and SALGA on a Phakisa to operationalise the National Water and Sanitation Master Plan. And the importance of platform such as the water resilient cities learning event to serve as forum to exchange lessons.



3. CONTEXT FOR WATER RESILIENCE IN SOUTH AFRICA

3.1 NATIONAL WATER AND SANITATION MASTER PLAN

Trevor Balzer, Department of Water and Sanitation

The presentation reviewed the master plan in light of important considerations for cities. Resilient cities are cities that have enough water to plan and manage their water responsibly. It was emphasised that water provision in South Africa is complex and resilient cities should build their strategy around existing infrastructure. The National Water and Sanitation Master Plan (NW&SMP) is a call to action, to ensure water availability in perpetuity. The NW&SMP was developed in partnership with all relevant organs of state, water sector stakeholders and international partners especially since 40% of our water is transnational. A successful implementation of the NW&SMP is essential for South African achievements targets set out in the National Development Plan (NDP) Vision for 2030 and the Sustainable Development Goals (SDG Goal 6 2030), of affordable and reliable access to enough and safe water and hygienic sanitation for socio-economic growth and well-being, with due regard to the environment. Furthermore, the NW&SMP is aligned with the achievement of the objectives of the President's Economic Stimulus and Recovery Plan (ESRP) the initiatives and programmes that were pronounced in the State of the Nation Address-2019 (SONA) and the SAFE initiative. The success of the country's democratic project is underpinned by the constitution especially by the two principles calling for: the right to a safe environment and the right to water and food. These important principles are enforced under the National Water Act. When discussing resilient cities, it was important to recognise the impact of climate change as well as look at the water issue holistically including the consideration of social issues, engineering solutions and climate change.

Mr. Balzer emphasised that there was a dire need to look further than cities to ensure city resilience. It was also essential to maintain and manage sustainably the country's ecological infrastructure. This, in practice,

translates into the necessity of looking after our water source areas. As demonstrated by a recent study from the Water Research Commission, those areas provide 50% of SA's water and represent 10 % of the land which is under local government. In economic terms those resources are fundamental for the economy as they supply 64% of national economic activity and ±70% of irrigation.

The NW&SMP's philosophy was built around two objectives the improvement of water and sanitation management on the one hand and the creation of an enabling environment on the other. Around each of those objectives were twelve critical elements. To realise its objectives the plan also lists several solutions such as optimising the water mix, increasing groundwater, use, re-use of effluent from the waste water treatment plants, water reclamation, desalination, and treated acid mine drainage (AMD). Other institutional measures include addressing the real value of water; and an institutional effectiveness assessment the Municipal Strategic Self-assessment (MuSSA). MuSSA determined the overall business health for WSA's by identifying key municipal vulnerabilities across a range of business attributes and implement the MPAPs that is the result of the MuSSA programme.

Finally, the creation of an enabling environment and the operationalisation of the Master Plan was in process thanks to the Phakisa scheduled to start in July. Operation Phakisa is a fast results delivery programme that was launched in July 2014 to help government to implement the National Development Plan, with the ultimate goal of boosting economic growth and create jobs. The Phakisa on Water and Sanitation will see sector partners agree the concrete actions, budgets and timeframes necessary to implement the Master Plan and ensure a water-secure future for the country, while also addressing the triple challenge confronting the country, namely poverty, unemployment and inequality. All participants to the water resilient cities learning event are encouraged to take part in this inclusive process.

3.2 THE INTEGRATED URBAN DEVELOPMENT FRAMEWORK

Nomkita Fani, CoGTA

Ms. Fani stated that the largest urban populations reside in Asia and Africa and the IUDF is the SA urbanisation framework to address this issue. South Africa is already highly urbanised but not generating the expected urban dividend and there is a high degree of inequality with numerous challenges of urbanisation. CoGTA want to see urbanisation as investment opportunity rather than a cost and needs to ask the following questions: Who is growing our economy and how? Who is shaping our cities and how?

The core elements of the IUDF are compact, connected and coordinated cities. Partners implementing the IUDF are National Treasury Cities Support Programme, DCOG - Intermediate city municipalities support programme as well as SALGA's small-town regeneration programme. There are 39 immediate cities, with the IUDF piloted in 2 cities - uMhlatuze and Polokwane. There are 9 policy levers that effect the IUDF response - ecological restoration, building standards are met and maintenance is done. The effective implementation will require joint effort - multisectoral partnerships through empowered communities; and sustainable finances.

3.3 CLIMATE CHANGE AND CITIES

Intelligent Chauke, SALGA

The presentation focused on building resilience in urban water systems facing climate change. The presentation started with a definition of climate change and the notion that climate change cannot be managed and only a response to it can be prepared. As water is the connector allowing everything in the economy and society, if water is affected, every connected system will also be affected. The need therefore arises to adapt and mitigate climate change across all interlinked sector, tackling the water nexuses of water-agriculture, water-health, water-human settlement and water-urban planning.

She emphasised that there was a need to cut across measuring several issues, looking at them through a climatechange lens. For instance,for policy makers to

plan, tools-such as a map super posing climate projection with human/economic development, would be useful. Possible responses to climate change come in the form of mitigation and adaptation.

In Municipalities, resilience is interpreted as sustaining what is currently being done. However, there was a dire need to do more than that, adding an additional element on transformation to bounce forward rather than back. In this regard, reaching out to un-serviced areas represent an opportunity to exert this transformative resilience.

It was stressed that there was a need for cross cutting skills (socio-economic- engineering) to first understand the vulnerability, creating an emotional connection and then manage the resources. Climate science should be brought to human scale and in dialogue with municipality to inform decisions.



The following tools for adaptation planning were provided:

- ✔ **Green Book** - The Green Book an online tool supporting municipal planning with the development of climate resilient settlements. It ultimately facilitates the mainstreaming of climate change adaptation into local government planning instruments and processes (CSIR) <https://www.greenbook.co.za/>
- ✔ **Let's Respond** - A toolkit and guide that aims to support the integration of climate change response into municipal development planning tools such as IDP and municipal sector plans (SALGA/DEA/GIZ) <http://www.letsrespondtoolkit.org>

3.4 PANEL DISCUSSION

Context for water resilience in South Africa

Panelists: Nomkita Fani (COGTA); Intelligent Chauke (SALGA); Trevor Balzer (DWS); Tumelo Gopane (MD ERWAT)

Discussion points:

- ✔ Redundancy standard engineering norm is 20% redundancy while most of our infrastructure is sitting at 210% utilisation. Huge opportunities for PPPs exist which are not fully exploited. Local and foreign banks can finance infrastructures if projects are bankable. ERWAT is currently looking into this.
- ✔ On wastewater, there are currently no tariff, water quality is neglected. South Africa should look at by-laws on industrial affluent. A centralised GIS on water and wastewater infrastructure is needed. ERWAT has now started integrating telemetry to give a picture of pumping stations. ERWAT is developing a new tariff including CAPEX.
- ✔ Johannesburg suffers from water stress as there are no alternative sources of water beside rain. Non-revenue water is affecting revenue recovery. Flat rate areas are a big part of the problem as there is no incentive to close taps. Capital investment is lower than it should be, and asset replacement is not happening fast enough which in the long run will have serious consequences.
- ✔ Focus should be on non-revenue water and water demand management, decreasing demand while increasing supply, rather than building new infrastructure. It's about using what we have more effectively. Another opportunity to be explored is the re-use of waste water from themines. Open storm water management and a major use of JoJo tank should also be further capitalised.
- ✔ The master plan is 30 Billion underfunded and prioritisation is difficult. However, the Phakisa could help developing a methodology to support prioritisation. Reconciliation strategies are a good basis of information to support the prioritisation.
- ✔ Sanitation: going forward some of the excellency in RDI and from the WRC which have been implemented outside of the country should also be applied in South Africa. Not enough of this knowledge is currently capitalised.
- ✔ Funding is available for infrastructure development, when bankability is proved. Proposals should be made competitive by giving great attention to pre-steps. Co-funding condition as well as financial standing and auditing make also applications prohibitive.
- ✔ Improving dam storage capacity in the future might be a white elephant considering rain scarcity in the future. Appropriate technology such as dry sanitation should be considered for long term return.
- ✔ Water use efficiency as well as energy efficiency needs incentives. Climate Change should also be communicated as a moral obligation, those two dimensions needs to be reflected in policy objectives.
- ✔ IDF finances new infrastructure if three conditions are in place: 1) a loan has been obtained and IDF will finance a part of it 2) maintenance budget has been allocated 3) good asset management is insured.
- ✔ Overall a switch from CAPEX to OPEX is needed.
- ✔ ERWAT has signed an MoU with Rand Water and completed a pre-feasibility study for water treatment that is than released back into the network. A project is running in UMhlatuze. ERWAT is also thinking in terms of waterless sanitation and sludge beneficiation to be used in agriculture.

IN SUMMARY:

- ✔ Water resources, water services need innovation and financial models should move things forward.
- ✔ Reconciliation of supply and demand options are mostly well known, either as pilot or research. But the scaling has not been done. An institutional framework carefully designed to transfer learning from national to municipal is needed. Partnership could have potential into bridging the capacity gaps.
- ✔ On the financial side for secondary cities there is still scope for borrowing but conditions apply.
- ✔ Not enough focus has been placed on PPPs, and incentive structures (ex. debt cancellation with restriction applied afterwards). Businesses should also be part of the solutions.



4. RESILIENCE IN WATER RESOURCES MANAGEMENT AND GOVERNANCE

4.1 CITY OF CAPE TOWN WATER RESOURCE STRATEGY

Mike Webster, City of Cape Town

Mike Webster noted that in the City of Cape Town, there were 4 million water sanitation customers - of which 40% received free basic water services. The City has 75 billion ZAR in asset value and manages water from source to tap to sea. In Cape Town, agriculture accounts for 100 000 jobs and 29% of water use. The recent drought was a 1 in 590-year event, with 2017 being the lowest rainfall over the last century - peaked at 38% during rainy season. Cape Town got through the drought primarily by demand reduction, aggressive pressure management, roll out of water management devices and leak repair, progressive pricing linked to 4 restriction levels, punitive drought pricing to 6 levels - level 6b in Feb 2018 the highest restriction achieved, and an intensive 2-year comms campaign and day zero messaging. Lessons were adopted from Sao Paulo to get restrictions in early and take them out late. What was interesting was that the contribution of augmentation to the water balance was insignificant - desal, Atlantis rehabilitation, springs, etc. The City was awarded the #1 Water Saving City in the world, achieving a 55% reduction without resorting to intermittent supply. Because Cape Town is vulnerable to Climate Change related risks, regional resource risks need to be better managed and there is a need to build ahead of time and diversify. Day zero messaging had mixed impact - it is important to learn from international experience and make use of it.

The newly finalised Cape Town Water Strategy was a brief 25-page document with 5 commitments. Together with an emphasis on reliability of water this was at the core of the strategy. Cape Town will always rely heavily on rainfed dams but is also looking to diversify through a build programme to reduce the likelihood of severe restrictions in future. This will involve building infrastructure that will be mothballed for periods - and this is simply a

necessity. Pressure management is a key part of water future with the city split into pressure zones. We are now at a point where regional sources are at a maximum. The city has set aside funding for alien vegetation clearing and the Cape Flats aquifer is plentiful but polluted. Table Mountain aquifer is plentiful but expensive to pump as it is deep and with iron and MN contamination. Zandvliet is a test case to prove ability to treat wastewater for potability to 10MLpD. Faure new reuse plant to come online in 2023 - learning from Zandvliet (70-100MLpD). Three temporary desal plants - 16MLpD and scalable desal (50-150MLpD). There will be more restrictions in future, but the aim is to be more predictable and move from a water supply city to a water sensitive city.

4.2 GROUP DISCUSSION

Q&A Mike Webster, Peter Flowers City of Cape Town

The following points were put forward:

- ✔ You cannot build yourself out of a drought. The situation in the drought could have been worst without the construction in 2006. Application of restriction does not happen overnight.
- ✔ Only one of the dams make provision for ecological reserve which is now a requirement.
- ✔ The footprint of cities is outside the water sources but need to manage the broader water area, this include making long term plans for alien invasive clearing. Solutions should be more ecologically driven not only engineered driven.
- ✔ Cost of desalination is being driven down (i.e. Saudi Arabia). PPPs could drive procurement as private sector insures value for money.
- ✔ Communication is key to gain consumers' confidence
- ✔ Sewage blockages are costly, the same amount should be spent in preventive educational campaign.

- ✔ Boreholes are currently undervalued and under regulate. Water service intermediaries, companies who want to go off the grid are growing. In the long run this will affect revenue generation. Thus, further regulation is needed.
- ✔ Boreholes abstraction needs a greater understanding. In the cape flats and in the TMGA. A very close look on the performance of the ground water is needed.
- ✔ Cape Town demonstrated that the creation of an enabling environment and getting off grid using different infrastructure has proved effective in

supporting resilience. The city reduction was in a large part the result of a revolution of innovation in the houses (recycled, JoJo tanks, rainwater, grey water) The role of the city can therefore be to provide this enabling environment.

- ✔ A proposed solution to non-revenue water include: water leaks repairs at first coupled with pre-paid water and annulation of debt for those accepting the packages.



5. ALTERNATIVE APPROACHES: WATER RESOURCES, WATER SERVICES MANAGEMENT

5.1 PARTNERSHIPS FOR WATER SOURCE AREAS

Christine Colvin WWF

Ms. Colvin stated that water does not come from a tap! WWF has recently launched a water journey to raise awareness on the long journey water undergoes before coming out of our taps. During the journey, water heroes have also learned about alien invasive plants and the importance of clearing action. Whereas the journey of water website can tell which water source area your city relies on. WRC has identified and mapped the water resource areas (surface water source area and, ground water source area). Water source area represents 10% of our land and gives us 50% of our river run off. Those areas are key as investment into good land management of water resource area secure more run off. However, management can be difficult as they are in remote mountainous areas.

Water source partnerships are an effective tool, as engagement of communities public and private sector is critical to try mobilising more resources and crating platform for inclusive conversation. A success story is the Boland water source areas. Even though Cape Nature is in charge, a partnership approach is always more comprehensive. The private sector is also a very involved in those partnership to fund the processes. Each of the water source areas is different thus every partnership needs to be tailor made and bring unique benefits.

Return on investment per cost on alien plant removal seems much more viable than desalination. Alien clearing is especially bankable in the water source areas. Many bankable projects that can be implemented in a partnership approach exists such as water ponds, ecological infrastructure for water security. However bankable institutions are missing. Lessons on Cape Town drought have been collected as an awareness tool in a booklet format. Other initiatives which are relevant to cities are the one planet city challenge and the water risk filter, which will be updated in May.

5.2 GREATER CAPE TOWN WATER FUND

Louise Stafford, TNC

Ms. Stafford introduced the concept of a Water Fund. The Water Fund is guided by the The Nature Conservancy's Urban Water Blueprint for Sub-Saharan Africa. Currently it was looking at the Cape area and Algoa in Eastern Cape with possible future opportunities for other cities. The Water Fund is a finance and governance mechanism that is not duplicating any efforts or taking away the mandates of government. It is catalytic and aims to build capacity, networking and support for catchment management. Two thirds of catchments that supply water to CT are invaded by aliens, which amounts to 55 billion litres water per year. The Return on Investment (ROI) for current water saving prioritises Ecological Infrastructure in 7 sub catchments and R372 million is needed over 30 years for targeted catchment restoration.

This amounts to 1/10th of the cost of other augmentation projects. This could take the form of capital funding and a downstream contributor mix, which is driven by reducing their

footprint. A blend of Corporate Social Investment (CSI), philanthropy and government funding will make up the Fund. Sustainability is a key issue to secure the investment.

5.3 THE ETHEKWINI SIHLANZIMVELO PROJECT

Geoff Tooley, eThekwini Municipality

Mr. Tooley introduced the Sihlanzimvelo Project by contextualising where it was located. eThekwini Metropolitan Municipality has 7400 km of river bank and climate change is increasing flooding and reducing water quality. Alien vegetation and solid waste represent a constant challenge to municipal infrastructure. Eight departments in eThekwini are struggling and suffer financial losses because of alien invasive species and refuse which are on the river banks. In 2007 the

Municipality started looking at alternative solutions and piloted a local community programme to look after the streams. The programme, after two years preparation, kicked off in 2009. Fifty-nine cooperatives founded by the municipality employing 472 workers were set up and are operational. The new model allowed for the cleaning of 295km upstream. Beside considerable environmental benefits such as improved water quality, the program also created 472 new jobs and helped raise awareness among communities, who would now police river banks to ensure their cleanness. This proved to be a success and the Municipality is now looking at ways of upscaling to cover the 7400km of riverbank while enhancing the 4 perceived benefits: 1) job creation from cleaning and further business opportunities created from solid waste recycling 2) Improved water quality 3) reduced erosion potential (through alien clearing) 4) cleaner river banks.

The speaker also presented a clear business case for this innovative approach as R12M is needed to fix damages caused by solid waste refuse as well as alien invasive plants whereas R0.5M were enough to manage the river 24 months of maintenance in one go. The C40 Climate Finance municipalities, a finance facility assisting cities in making their projects bankable, is currently supporting the eThekweni Municipality to realize its ambitions. Currently a special project advisor has been seconded to the Municipality and a cost benefit analysis is in progress. The next steps include developing a bankable business plan with the support of the C40 facility. The biggest problem is that, despite demonstrable financial gain from the application of the Sihlanzimvelo innovative approach in cities, it is hard to access capital to finance those initiatives as most of the capital is ringfenced for replacing or building infrastructure.

5.4 PANEL DISCUSSION

The following points were put forward:

- ✓ Bankable institutions are lacking mainly because of incomplete institutional transformation. Huge amount of uncertainty in institutions such as water user's association, as there is no certainty on their future existence.

- ✓ Need to discuss ringfencing of resources with local governance, to be reinvested in projects with high impact.
- ✓ Despite good business cases alien invasive clearing is underfunded and not prioritised. A blend of public and private sector funding in a partnership approach has proven successful in the role of clearing invasive alien plants and maintaining. However more stable funding is needed to insure continuity. Spin-off opportunities for small enterprises creation exists, however enabling support is needed.
- ✓ The Sihlanzimvelo project initially attracted lots of enthusiasm however it was hard to receive economic commitments from the different departments. A bankable case study would bring the right departments around the table. The different departments would share the responsibility but would operate jointly for cost efficiency.
- ✓ Takes time to get river management to be manageable financially as the first clearing is expensive and external funds are needed. Ringfencing of saving is essential for the project success.
- ✓ To unlock funding the following is needed: 1) good governance and transparency in how the money is spent 2) alignment: crucial within municipality to align around a common objective, 3) Sustainability strategy imbedded into the governance. 4) quantifiable results
- ✓ To improve financing of alien invasive clearing project it is of strategic importance to look at the bigger picture. A holistic picture pointing out interdependencies should be painted.
- ✓ Incentives for private land owner who are compliant with alien invasive plant clearing should be established.

6. RESILIENCE IN WATER SERVICE MANAGEMENT AND GOVERNANCE

6.1 A 10 STEP APPROACH TO TACKLING NRW ISSUES THROUGH STEWARDSHIP

Willem Wegelin, WRP

Stewardship is about taking care of something that we do not own but that is important to us. Water stewardship promotes collective, multi-stakeholder action around water security challenges, including the reduction of non-revenue water, and represents an opportunity for municipalities to work together with communities and the private sector to reduce water losses and increase revenue. The GLZ-Integrated Water Resources Stewardship Programme together with partners have implemented several non-revenue water projects in a partnership approach. The presentation collected lessons learned and structured them to provide a practical guideline in 10 steps for implementation of such projects. Below the ten steps are explained:

1) Engage the Right Stakeholders

The public sector includes national, provincial and local government should be the main beneficiary and take the lead to implement the project in the interest of the community. The private sector includes privately owned organisations could offer funding, expertise, capacity and or skills. However, investments should be partially aligned with internal objectives. Non-governmental organisations including funding organisations, civil society and other government organisations are key in offer funding, corporate governance, capacity, skills, oversight and as a neutral broker at the partnership inception. The community includes the local community directly affected by the stewardship project or the greater community indirectly affected by the project through improved service delivery, saving water to the benefit of other areas, improved water security in the region or catchment

2) Develop Mutually Beneficial Objectives

A partnership approach to be successful should offer a win (public sector) - win (private sector) - win (non-government sector) - win (community) result. All

stakeholders must benefit from the project.

Furthermore, objectives and potential outcomes must be clear and transparent with no ulterior motives than the reduction of non-revenue water losses and aligned with national, provincial and local government strategy and policy. Development of measurable objectives and key performance indicators is also essential to measure the outcomes of the project.

3) Getting the project started

Specific consideration should apply to project inception specifically regarding the engagement of government officials. To engage officials, proposals as well as MoU should be clear and concise, procedures should be followed, project's targets should be realistic and achievable. In choosing the municipality to cooperate with, in a partnership approach, stakeholders should be mindful that municipalities with the greatest need often carry the greatest risk in terms of financial commitments, corruption, ulterior motives, lack of technical capacity sustainability and repeatability.

4) Set-up steering and management teams

Project steering and management committees are required to set-up, steer, implement and commission the stewardship project. The following committees should be established:

- ✔ The Project Steering Committee (PSC) represents the key project stakeholders;
- ✔ The Project Management Committee (PMC) is responsible for the day-to-day management of the project.
- ✔ The Stakeholders Committee (SC) provides a platform for other government departments,
- ✔ An Implementing Agent should be appointed to oversee the implementation of the project.

5) *Ensure sustainable financial model*

The funding model should be clearly defined in terms of who pays for what and should state the risks if savings are not achieved. Water loss reduction projects should include a performance-based component to incentivise the implementing agent, contractor and local labour. The risk exist that financial benefits would not be ringfenced in cash-strapped municipal environment. Most funding is provided by the Municipality however the private sector can play a great role in kick starting the project, while NGO and can support mostly on capacity building.

6) *Procurement of products and services*

The Project Steering Committee should decide which institution's procurement procedure will be followed and if these procurement processes are aligned and acceptable to all parties. Appointment of local labour should be carefully managed to avoid favouritism, cronyism and nepotism.

7) *Baseline assessment to measure savings*

As to measure is to know, a clear water balance should be established prior to the project start and savings should be calculated monthly against the baseline. It is also key to clarify the area of action. All stakeholders must agree on the baseline as it has a direct impact on the measurement of the potential savings

8) *Implementation of interventions to reduce non-revenue*

To insure a successful project, it is essential to determine, in conjunction with the municipality, where the losses are, quantify the losses, and plan how to address them. Suitable interventions should focus on the reduction of authorised consumption (increased efficiency), commercial losses and physical losses and address technical, social, financial, legal and institutional challenges using appropriate technology.

9) *Ensure sustainability*

Training and capacity building as well as transfer of skills and sharing of knowledge should be provided at all levels in the municipality to ensure the sustainability of the interventions.

10) *Project closure*

Project closure should include a complete handover reports, drawings and other documentation to municipal staff. As well as presentations to council and clear communication of hand over to the community.

6.2 MUNICIPAL WATER QUALITY CHALLENGES IN THE URBAN ENVIRONMENT

Melissa Lintnaar Strauss - Scientist Manager Water Programs and Information Directorate DWS

The presentation illustrated the main water management areas in the Western Cape and pointed out all relevant legislation regulating water management. All legislation points towards the need to protect water resources insuring sustainability for the future as well as good water quality. Water quality issues in urban areas are mainly caused by: urban run-off that discharges into storm water drains; partial or non-treatment of effluent from waste water treatment systems; destruction of ecological infrastructure such as wetlands and estuaries due to poor land use and management practices; lack of proper sanitation in informal settlements and uncontrolled abstraction of groundwater in urban areas.

Measures to control water resources starts with the determination of resource quality objective as well as identification of negative environmental impact from domestic, agriculture and industry. The department also recognise the importance of ecosystem services that water is providing such as estuaries and wetlands, tourism, nursery and subsistence fishing.

Action ensuring good water quality is carried out systematically by the Department through a 7-step process that include looking at the catchment and delineating the different areas. Followed by an analysis of dams, ground water, wetlands and rivers and a prioritisation of

most important rivers. Resource quality objectives have also been developed and municipality are informed of the water quality standards to be followed through the gazetting of water quality objectives. Different rivers are classed into categories to signal where there is scope for improvement.

Partnerships have also been used as a mean to achieve good water quality, successful examples can be found in Stellenbosch River Collaborative, Berg River Partnership, Waste Discharge Charge System registration and Collaboration with water quality monitoring.

Further action to be carried out include: advise Local Authorities on alternative methods to manage storm water quality and urban runoff, on the use of greywater systems; working closer with housing developments to account for quantity as well as quality aspects of stormwater management; consider good quality stormwater as an alternative source of water; improve compliance of WWTF; mainstream partnership uses within the DWS.

6.3 THE ROLE OF SCIENTIFIC SERVICES IN WATER RESILIENCE

*Mpharu Hloyi, Water and Sanitation Manager
Scientific Services, City of Cape Town*

The presentation started by describing the quality of a scientist capable to do such an important job as advising a city on water resilience. Scientist need to be rational as well as intuitive, with an ability to conceptualise people and advise, have the right communication skills to influence as well as curiosity and attention to details. Those highly qualified scientists sitting in the water and sanitation scientific service in Cape Town have the following mission “to be a beacon in Africa through the progressive realisation of Cape Town as a water- sensitive city” and “to be a leader in the provision of credible quality laboratory services for excellence in water and environmental management”. This mission is realised in alignment with water and sanitation vision and in collaboration with WRC and academia. The SSB was initially established in 1923 and its core function touch upon: water and air quality, environmental pollution and professional advisory services.

The service also played a role during the drought by testing the safety of Cape Town spring water, continuously monitoring the water quality. To communicate effectively, signage was posted on public springs, indicating water quality. The groundwater quality investigation also contributed to crucial project of augmentation of drinking water supply. The service was also involved into the water desalination plan. SSB also produces several researches to inform policy making. The service recently launched scientific network forum to share knowledge across municipality via science community.

6.4 PANEL DISCUSSION

The following points were put forward:

- ✔ Working on non-revenue water in communities can sometimes be difficult. However initial tension can be overcome by systematically engaging with the communities and addressing issues one by one. It is critical to keep meetings and conversation focus on water problems. It is also important to raise awareness on behaviour change.
- ✔ Escrow accounts have a good potential for ringfencing savings
- ✔ It is important to demonstrate the added value of non-revenue water partnerships by showcasing success stories. A success story is Tshwane, where thanks to good results of the initiative, the municipal manager could bargain for ringfenced funds that could then be reinvested.
- ✔ Communities do not trust government, to work with communities a third neutralparty as a broker is needed.
- ✔ Partnership work can be difficult, and misunderstanding can occur along the way, this can be overcome by keeping open channel of communication. A successful example is the Berg River Partnership that almost ended up in court but then managed to improve relationships with its members.

7. ISSUES IN FINANCIAL PLANNING FOR WATER RESILIENT CITIES

Chris Serjak introduced the USAID WASH-FIN programme. The purpose of this session was to discuss approaches for water resilient cities to finance these measures. The session was joined by CFOs of municipalities, economists and funding agencies.

7.1 WATER AFFORDABILITY

Lerato Shai- PDG

PDG is a public sector financial consulting firm, presenting on WRC report around the concept of affordability - both the ability and the willingness to pay for services. The study looked at 150 households and 4 municipal case studies. Census 2011 data was matched to municipal billing data, income, water bills and consumption datasets. The study looked at 3 measures - 3% ratio threshold, residual income approach and under-consumption. The key findings were:

- ✓ 10% find water unaffordable because bills too high
- ✓ 2% find water unaffordable because income too low
- ✓ 11% find water affordable BUT consume less than minimum

The factors involved were either incomes were too low, or households were consuming too much. The bill did not push households below poverty line as they were already poor. Existing approaches to provide free basic water are failing to completely address affordability issues. Lower income households use less water, but this is different per municipal area. The implications are that a blanket approach is not effective - 6kl allocation does not protect poor households from affordability constraints. Beyond setting tariffs it is about limiting consumption and the relationship between income and consumption is a crucial consideration.

7.2 MUNICIPAL FINANCIAL PLANNING

Kim Walsh- PDG

From the public sector there are the following mechanisms:

- ✓ Intergovernmental transfers - grants for defined purposes, subsidies for special temporal assistance.

May be direct or indirect (through another entity on their behalf)

- ✓ International donors - conditional or unconditional
- ✓ Borrowing - loans from commercial/development institutions or municipal bond financing (borrowing regulated through MBPF). Only available for capital projects not operational costs. National government does not stand surety for loans. Municipalities often default - few examples in SA. Balloon payment can be made when asset generating revenue and sink fund is available to cover that payment. The trends indicate that in city metros, transfers are decreasing. Budgets suggest the intention to increase borrowing. This is different in secondary cities where transfers are larger and there is less intention to borrow
- ✓ Internally generated funds - cash surpluses earmarked for CAPEX. The key issue is the ability of the public sector to generate this with

From the private sector there are the following mechanisms:

- ✓ Land-based financing - development charges - private developer benefits from improved value of land and this value goes to municipality. Underdeveloped currently but important for future or private provision of infrastructure as an in-kind donation to municipality.
- ✓ Public Private Partnerships - outsourcing - leases - concessions - privatisation. This is a popular mechanism throughout Africa.
- ✓ Non-revenue generating (grants and transfers) and revenue generating infrastructure (PPPs, loan funding)
- ✓ New infrastructure vs renewal - there is a need to finance renewal in practice. Depreciation is not happening in practice to renew.
- ✓ There is an ability to raise finance based on financial viability of the city and not just on the merits of the project
- ✓ Financing = raising upfront capital; whereas funding = revenue streams in future to repay financing. Often there is financing but funding is the issue.

7.3 ACCESSING FINANCING: CREDIT WORTHINESS AND PROJECT PREPARATION

Jeremy Gorelick- WASH-FIN

The challenge isn't the lack of bankable projects but the lack of bankable institutions. Even this is not entirely correct - there are not enough bankable projects either. The idea of creditworthy institutions instead of bankable. Water has an unclear asset value and there is limited commercial lender knowledge of the sector. South Africa has a sophisticated financial sector with a mix of investment grade and speculative grade municipalities (according to Moody's). 81% of intermediary cities have been assessed as investment grade. The Infrastructure Consortium for Africa Project Preparation Fund Finder, IIPSA Project Preparation Facility (DBSA, BMZ) and the C40 Facility are some of the tools and resources available online to guide creditworthiness

7.4 GROUP DISCUSSION

The following points were put forward:

- ✔ Study by the Global Water Leaders Group - similar study found that poor people had cell phones and DSTV but didn't pay water due to poor service delivery.
- ✔ Contingent evaluation methods would need to be considered for willingness. This PDG study only focussed on ability.
- ✔ In City of Joburg, there are different tariffs for different areas. Leaks are not fixed in areas with fixed billing- no incentives. All Joburg municipalities have indigent policies. Only in Ekurhuleni - everyone gets 6kL.
- ✔ Inclining Block Tariffs (IBTs) useful in some cases
- ✔ Municipalities have payment backlog problems with creditors like Eskom and water boards, but this is different from commercial financiers, who they tend to pay timeously. Treasury regulates municipal borrowing very well. Municipalities do default - but they are less likely to default on the private sector

who is more aggressive with punitive measures. How are municipalities allowed to build up debt without corrective action? How many municipalities are credit worthy for long-term loans? Estimate about 30? If their economic base is good - banks will still look at them. Whether they are mis-managed or not. There is often great reluctance to borrow even if they can, but it is worthwhile to borrow on revenue-generating projects.

- ✔ Question to the CFOs - what is the sense of financing?
 - ✔ City of Joburg has blended finance with similar mix to that presented. Funds from National Government are dwindling, and internal revenue is decreasing too. Their response is to put projects on hold and spend less, which causes big backlogs in infrastructure development.
 - ✔ City of Ekurhuleni is concentrating on finishing existing projects and not starting new ones; while it looks at other ways of raising funds.
- ✔ How are cities filling revenue gaps with declining revenue streams? Increase in tariffs are not sustainable year on year as collections go down. Should be matching financing terms with usefulness period of the asset - this could be better linked. The general feeling is 10 years max. Land value capture is not well used in South Africa, but it is in other parts of the world.
- ✔ Do we need to look at changing the tariff collection model? Treasury is doing research on alternative funding models. Fixed charges impact more heavily on the poor.
- ✔ Still missing the Ecological Infrastructure component? Catchments not known to municipalities - the perception exists that they cannot invest outside their boundaries. A case to be made for Ecological Infrastructure as infrastructure. The challenge that financial institutions have that they do not see a direct and causal link. There is a need to demonstrate ROI for the investor.



8. EXPERIENCE WITH FUNDING SOURCES, MECHANISM AND PROCUREMENT MODELS

8.1 CLIMATE FUNDS

Muhammed Sayed - DBSA

DBSA manages the Green Fund on behalf of DEA and has 8 capacity development projects and 31 investment projects. The Green Climate Fund has 5 projects approved. Post October it is hoped that funding will be replenished. To access this funding, institutions need to work through an accredited entity. DBSA is a regional entity from March 2016. DBSA only work on projects aligned to the core mandate of the bank. The NDA/focal point in South Africa is DEA and they deal with micro to large investments. The investment criteria considered is: impact potential, paradigm shift, sustainable development, responsiveness to recipient needs, promotion of country ownership, efficiency and effectiveness. The current portfolio is skewed towards mitigation, but water could be opportunity to change this if one could demonstrate the climate change link. Concessional terms are offered to vulnerable countries, but South Africa is not considered vulnerable. DBSA can offer blended finance with lower

rates as well as project preparation support. DBSA is an accredited NPA for GEF in 2014 with 6 projects approved and in the pipeline being prepared for GEF7.

8. PUBLIC PRIVATE PARTNERSHIPS

Andre Kruger-NBF

Is there a difference between privatisation and PPPs? Who owns the assets? In PPPs, government sets the transaction rules and private sector only manages the assets over the life cycle of the PPP. There are an estimated 380 PPPs in Africa. In South Africa there are 120 (according to the database at treasury). Only 10 African countries do not have PPP policies. The source of funding is mainly private sector but the integration of financial planning with asset management plans are not happening effectively. Alternative procurement is not addressed by consultants in planning for public sector. NEPAD BF is an accredited service provider for the PPP training programme. Pan Africa Water Finance Forum has been set up to improve financial governance around water.

8.3 MUNICIPAL POOLED FUNDS

Attie van Zyl -INCA

INCA was started in 1996 and is the largest private lender to the municipal sector - lending more than commercial banks. Provision for default is low and no write-offs have been recorded. Municipal debt is a potentially sound investment but credit assessment and monitoring of performance is essential. Cooperation between private and public sectors is also essential. Legislation that requires interventions by provincial and national government needs to be applied but this is not happening. Municipal debt to Eskom = 17bill ZAR at end of 2018. The opportunities are that there is a growing need for infrastructure development. Municipalities can generate a high percentage of income themselves and reduce pressure on the fiscus. The number of creditworthy

municipalities is approximately 25 and treasury is keen to assist the private sector in the Western Cape to monitor municipal performance. A new fund should have a 15-year term where lenders understand returns, risk and asset class and borrowers demonstrate transparency and capacity building.

8. GROUP DISCUSSION

- ✓ The question was raised whether there is scope to support a group of similar municipalities. This is DBSA's preferred approach. They would rather work on a programme approach rather than at project level.
- ✓ Is there a mechanism around tendering for proposals for PPP? Applicants need to adhere to MPMFA Section 78 process and do a coordinated feasibility assessment.

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The partners are grateful to all the speakers who contributed to the peer-to-peer knowledge sharing event, shared their insights, perspectives and sparked conversations on Improving water resilience and financing the needed investments.

- 👤 Councillor Thami Ngubane, SALGA NEC Member & Chairperson for the Water and Sanitation National Working Group
- 👤 John Goarke, USAID Regional Head of Mission
- 👤 Godje Bialloch Head: Governance Support Programme, GIZ
- 👤 Kevin Winter, Professor at the University of Cape Town
- 👤 Gugile Nkwinti, Minister of Water and Sanitation
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- 👤 Intelligent Chauke, SALGA

- 👤 Tumelo Gopane (MD ERWAT)
- 👤 Mike Webster, City of Cape Town
- 👤 Peter Flowers City of Cape Town
- 👤 Christine Colvin WWF
- 👤 Louise Stafford, TNC
- 👤 Geoff Tooley, eThekweni Municipality
- 👤 Willem Wegelin, WRP
- 👤 Melissa Lintnaar Strauss - Scientist Manager Water Programs and Information Directorate DWS
- 👤 Mpharu Hloyi, Water and Sanitation Manager Scientific Services, City of Cape Town
- 👤 Lerato Shai- PDG
- 👤 Kim Walsh- PDG
- 👤 Jeremy Gorelick- WASH-FIN
- 👤 Muhammed Sayed - DBSA
- 👤 Andre Kruger-NBF
- 👤 Attie van Zyl -INCA

PARTNER ORGANISATIONS FOR THIS 2ND WATER RESILIENT CITIES EVENT

THE PARTNERS





3RD WATER RESILIENT CITIES LEARNING EVENT

Theme: Water as a Strategic Enabler for Economic Development in Cities



African cities are also claiming their place in the global arena as drivers and stimulators of the continent's economic growth, thus shifting the perception of Africa as 'a hopeless continent' to one of 'Africa rising' with cities as the engines of its economic growth (Kebede, 2018).

3RD WATER RESILIENT CITIES LEARNING EVENT

Theme: Water as a Strategic Enabler for Economic Development in Cities

Date: 4th- 5th November 2019

Venue: Nelson Mandela Bay Municipality

1. INTRODUCTION

Globally, cities account for 80% of global GDP (World Bank, 2019) and are engines of economic growth where business, cultural, educational and scientific activities, and technological innovations thrive.

African cities are also claiming their place in the global arena as drivers and stimulators of the continent's economic growth thus shifting the perception of Africa as 'a hopeless continent' to one of 'Africa rising' with cities as the engines of its economic growth (Kebede, 2018).

African cities have been experiencing exponential economic growth that contributes an estimated \$700 billion to the continent's economy with the potential to double their contribution by 2030 (Bafana, 2016). The role and contribution of cities to further expand this economic growth trajectory and their ability to advance inclusion, sustainability and innovation can therefore not be under-estimated.

These cities are not only growing in GDP but also in population, with economic growth being a pull factor for rural-urban migration. It is predicted that the population in African cities will double from 1.1 billion to 2.2 billion in the next 30 years with 80% of the population growth happening in urban centres (Muggah, R and Hill, K. 2018).

This economic and population growth should, however, be decoupled from resource use and environmental degradation as cities and their economies are becoming increasingly vulnerable to the impacts of inefficient resource use, particularly water, and extreme weather events such as droughts or floods as a result of climate change (WEF, 2019). These challenges call for a transition toward improved water management and considerations of resilience.

1.1 PURPOSE OF 3RD WATER RESILIENT CITIES LEARNING EVENT

The 3rd Water Resilient Cities learning event held in November 2019 was organised under the theme: “Water as a Strategic Enabler for Economic Development in Cities”. The event brought into focus:

- ✔ How investment in improved water resources and water services management can, with intention and focus, enable local economic development;
- ✔ How the application of circular economy approaches in the water value chain, particularly energy capture, improves utility and city revenues;
- ✔ The most recent learnings and thought leadership in attracting, applying for and blending diverse capital sources;
- ✔ City experiences with applying disruptive technology - the smart city drive;

- ✔ Best practices in water security planning from Zambia, Uganda and Tanzania - to encourage peer-to-peer learning, knowledge sharing and dissemination in the region and beyond.

Participants - who were mostly city water managers, water utility managers, finance officers, city practitioners, local government support institutions and water regulators - were drawn from South Africa, Zambia, Uganda and Tanzania.

As an additional action for this event, the convening partners collaborated with C40 Cities Finance Facility. The C40’s programme, which focuses on access to finance for climate change mitigation and resilience projects in Cities held a complementary parallel session to the main sessions and focused on their specific work in the region, best practice examples and the instruments applied in the promotion of the finance facility.

DAY 1: SUMMARY OF PRESENTATIONS, BREAKAWAY SESSIONS AND PANELS

2. PRESENTATIONS SETTING THE SCENE

2.1.1 Welcome, Opening Remarks and Keynote Address

- ✔ Dr Faith Lawrence, Country Coordinator for GIZ’s Natural Resource Stewardship Programme (NatuReS) in South Africa
- ✔ Joseph Tsatsire, Senior Director of Water & Sanitation, Nelson Mandela Bay Metropolitan Municipality (NMBMM)
- ✔ Ashraf Adam, Chief Executive Officer, the Mandela Bay Development Agency (MBDA)

Dr. Faith Lawrence from the partner organisation GIZ NatuReS opened the programme on behalf of the partners, welcoming and thanking attendees for their presence and providing a brief background to the event.

Additional, remarks were delivered by Mr. Tsatsire, Senior Director of Water & Sanitation at the host city, Nelson Mandela Bay Metropolitan Municipality (NMBMM).

Mr. Tsatsire reported on the implementation of strict restrictions in the Nelson Mandela Bay Metro due to drought and highlighted the adverse effects this has on various enterprises, which he asserted will have a knock-on effect on the broader economy of the city. He stated that his hope was that by the end of the learning event, there would be better understanding and approaches to planning for adaptation to harsh climatic conditions brought on by droughts.

Ashraf Adam, CEO of Mandela Bay Development Agency and Board Member of the South African Cities Network gave the keynote address at the learning event. He focused on the critical influence that social behaviour - even in professional positions - has on water use and management. He argued that human existence and movement have always been determined by climate change i.e. changes in climatic conditions have historically been the main triggers for migration and that desert societies around the world have survived with limited resources of water for many years through appropriate management. According to Mr. Adam, this demonstrated that the problem was not

necessarily water (or other resources) but human impact on the environment as well as on other species that depend on water for their existence.

He added that it was necessary to revisit some policies and review their relevance to the needs of the country and its inhabitants. He emphasised the importance of identifying those who are responsible for water pollution and wastage, and ensure that efficient, effective and accountable practices are promoted across the sector.

In his address he emphasised that there are technological innovations, policies and infrastructure to respond to water challenges, but that implementation is lagging behind. This is an issue that is not only prevalent in the water sector, but can also be seen in other sectors such as housing and energy. Efforts need to be made to address this. Mr. Adam concluded that responding to the water management crisis required coordinated governance and policy implementation.

2.1.2 Setting the Context

Jay Bhagwan, Executive Manager of Water Use and Waste Management, Water Research Commission (WRC)

Jay Bhagwan gave an overview of the context by lamenting the persistent hydro-illogical cycle, which refers to the reactive, often panic-induced responses to drought in the country. It is termed illogical in that government interventions to water security are seldom preventative, with limited to no developed risk policies to respond to this common phenomenon, especially within the context of global climate change. In South Africa, the most commonly used demonstration of the hydro-illogical cycle is City of Cape Town. However, there are many other villages and smaller towns that experience drought on a regular basis but do not get as much attention as the metro. Research continually shows that drought is persistent: a recent finding showed that July 2019 was the hottest winter South Africa has experienced in the past 100 years. Droughts used to be in intervals of 5 - 15 years, however the period has become shorter over time due to climate change. Rainfall intensity levels have been particularly low, which has affected the recharge of aquifers. Big dams can no longer provide the amount of

water they used to as high levels of evaporation are some of the greatest challenges the water sector is facing.

The Water and Sanitation Master Plan and other government water policies are driven by the construction of large dams and inter-basin transfer (IBT) schemes to store water, augmentation of dam storage, and unsustainable exploitation of groundwater in some areas. These responses do not address the core problems: the lack of rainfall and the difficulty to institutionalise water demand management practices. There is indeed a need and willingness from practitioners for improved water management, however, there are no appropriate systems in place to respond accordingly. While some water conservation and demand management systems have been in place since 1995, water efficiency standards that were drafted in 1998 are only being propagated into policy now.

He argued that mechanisms were developed in the 20th century to solve 20th century problems, however responses have since not modernised in line with the changes in the world around the water topic. Despite growing innovative thought in research, there is limited progress in implementation, particularly in local government where innovative policies and practices are most critical.

Municipalities continually plan to improve water demand management but fail to factor in rapid urbanisation, which requires more water and waste removal services. For instance, in Lephalale, a growing town and economy generally characterised by dryness and erratic rainfall patterns, the average consumption is 1000 cubic meters per person, per day. Predictions show that fewer catchments in the future will have enough water to stimulate economic development and provide for growing urban populations. It is thus imperative that risk-reducing plans are developed now. One such intervention is to reduce water wastage by conscientising people and encouraging behavioural change.

Cities have the highest water demand level, with metros accounting for approximately 70% of all national supply, as well as 42% of national water wastage (including loss through leaking and burst pipes).

It was argued that residents should be contributing at least 3-4% towards the national water bill as this could help change patterns of use. Another risk-reducing intervention is the circular economy approach, which various research outputs have argued to be one of the most viable options. Industries, for instance can reduce wastage and run-off by extracting the maximum value of water through reuse.

The resultant increase in efficiency and productivity may help stimulate the local economy by making sustainable practices more financially attractive and potentially create jobs. Industries play a critical role because only 10% of water in SA is reused. Asset development in the mining sector (specifically surrounding mine closures) for water reuse in agriculture is growing exponentially to supplement the water shortages that exist. Another direct means of recycling is through greywater reuse, which can save 60% of the current flush wastewater.

In conclusion, the presentation highlighted that cities tended to overlook water quality now that blue drop and green drop reports were no longer mandatory. The following were outlined as key elements

for adequate water management:

a) Customer

- ✓ Water use patterns
- ✓ Leak detection

b) Utility

- ✓ Leak detection
- ✓ Demand management
- ✓ Customer engagement
- ✓ Water quality management
- ✓ Supply system management

c) Regulation

- ✓ Price control
- ✓ Monitoring provision of services

2.1.3 Water Management in NMBMM: current challenges and future perspectives

Barry Martin, Director of Water & Sanitation at Nelson Mandela Bay Metropolitan Municipality (NMBMM)

The presentation provided an overview of the challenges prevalent in the water department, highlighting the financial and governance issues that contributed to the challenges. Mr. Martin stated that there are very limited alternatives for water supply besides desalination but argued that the City was not yet ready to explore that due to the high price linked to ensuring that the water is consumable.

He therefore emphasised the importance of ensuring that water in the city is used sparingly, and with caution. He added that the Groendal water system, though not yet complete, is set to be the biggest water supplier in the city with the potential of accounting for 50% of the city's water supply. However, there is a high iron infiltration in the water that needs to be treated before the water can be used.

The NMBMM acts as both a water services authority and water services provider for its area of jurisdiction. Out of 7000 employees, only 10% work in the water sector - the majority of which play multiple professional roles that are sometimes not limited to the water department. Water and sanitation are regarded as the most significant asset base in the City, at approximately R21billion. The related infrastructure investment is sometimes deemed uneconomical, though over time, it pays off. The Water & Sanitation (W&S) Capital & Operating Budgets form part of the total NMBMM Capital Budget as identified in the following documents:

- ✓ Integrated Development Plan
- ✓ Water Services Development Plan:
 - ✓ Water Master Plan
 - ✓ Sanitation Master Plan
 - ✓ Spatial Master Plan
 - ✓ Spatial Development Framework, and the
 - ✓ 10-year Housing programme

One of the challenges highlighted was that a total of 132 informal settlements and cases of land invasion have recently been reported which have impacted on the ability of the municipality to effectively address infrastructure backlogs, reiterating earlier remarks made on the impact of rapid urbanisation on service delivery. The W&S budgets were such that water allocations amounted to R3.71 billion and sanitation allocations amounted to R4.83 billion with maintenance response times averaging at 24 hours. The turnaround time was adversely affected by resource constraints (finance, staff, plant and equipment), some of which stem from the vandalism of assets (e.g. theft of wires). A loan was in place to respond to some of the workstream activities (bulk water supply and bulk water meters, pressure management, leak repairs, water meter replacement etc.), however, integrating infrastructure that had been developed for different functions (social, private, business, etc.) was critical.

On the governance side, a section has been added in the municipality's Water Demand and Management Plan addressing the challenge of sharing responsibilities among the relevant units and staff in order to improve efficiency. The Plan responds to the lack of recruitment of staff skilled in civil engineering, artisanry, and fitting and turning.

Regarding the financial implications of water management, it was stated that efforts were needed to ensure consistent understanding of contracting arrangements across the Supply Chain Management functions in Cities. This would be helpful. A significant challenge is also that infrastructure expansion commonly takes on average 87 months (7.25 years) to implement. This means the project goes through various stages and auxiliary services however, this does not match the fact that municipal policies and the related contract time frames often stipulate project completion to be within 3 years. This misalignment needs to be addressed across Cities.

Mr. Martin concluded by arguing that diversification of water sources has repeatedly been underscored i.e. ground water use and reuse of effluent water especially in cities, given that 50% of the rural population is expected to move to metros by 2050. He pointed out that farmers are the highest users of water globally therefore improved irrigation activities must be explored in order to reduce yield loss effects. If desalination becomes nationally prioritised, farmers must be given enough water and agriculture as an industry must pay for this privilege.



Q&A SESSION: SUMMARY OF RELEVANT POINTS AND QUESTIONS

The following points were raised during the interactive session:

- ✔ How to conscientise people about water wastage.
- ✔ How to begin grappling with the shortage of systems and skills required for water management.
- ✔ Each city must have a Key Performance Area (KPA) that makes it compulsory for them to adopt at least one water management related innovation. Question around whether the WRC has an embedded mandate to hold municipalities accountable in that regard.
- ✔ While large percentages of people are characterised as indigent in South Africa, they have access to social grants and are therefore classified as consumers who can afford to pay for water.
- ✔ Advanced metering was considered ground-breaking research in South Africa but has not been successfully embedded. There is a need to adopt and scale-up such research.
- ✔ It is important to underscore that the lack of adequate governance and leadership have adverse effects on the success of projects and contribute to overall mismanagement of water sources and processes.
- ✔ The Department of Cooperative Governance and Traditional Affairs (COGTA) seems to have made no inputs regarding how cities must change or adapt. It was suggested that CoGTA and SALGA play a more active role in identifying and strengthening internal systems that do work.
- ✔ It was emphasised that procurement processes are often tedious and repetitive, resulting in inefficiencies such as delays in project implementation.

2.2 CONTEXT - WATER FINANCING, PLANNING AND REGULATION

2.2.1 Economic Status of Water in the Country: Trade-offs

Misaveni Ngobeni, Director of Urban Development and Infrastructure, Department of the National Treasury

This presentation discussed National Treasury's position on water matters and budget allocations, within its broader imperatives to improve economic growth and job creation. Mr. Ngobeni concurred with the event's theme that water and sanitation were essential services that contributed vastly to job creation and economic prosperity in industries such as mining, energy, etc.

Over the last five years, there have been significant increases in Capital Expenditure (CAPEX) demands towards infrastructure development. Concurrently, existing infrastructure has either aged or was inadequately built and can thus not withstand emergency shocks that might emerge due to climate change. Water infrastructure is a challenge that requires urgent attention, but this should not translate to more policies as poor planning and regulatory issues may exacerbate conditions and challenges.

The National Treasury considers the main national water challenges to include:

- ✔ Increasing water security risk
- ✔ Water demand not being effectively constrained
- ✔ Ageing water and sanitation infrastructure and deteriorating performance
- ✔ Planning, policy and regulatory challenges

Mr. Ngobeni stated that the national government was responsible for a R1.8 trillion budget, but that the water budget in relation to other sectors such as education and social grants was very low even though the biggest contributing industries to the GDP are dependent on water, e.g. manufacturing contributes 12.3% compared to agriculture which is the biggest user of water but contributes only 3% to 7% to formal employment. The agriculture sector is one of the first sectors to be directly impacted by water shortages and drought as it contributes to food security, job creation and to the viability or productivity of other sectors. The financial value of agriculture therefore warrants special attention when deciding on the competitive allocation of water among sectors. It is important to note that while the manufacturing industry is the bigger contributor to the GDP in comparison to the agricultural industry, the latter supports about 25% of the manufacturing sector's contribution to the GDP.





South Africa has been experiencing extreme drought conditions due to El Nino (severe heat) since 2014. This has affected eight out of the nine provinces in the country (Gauteng was the exception), which have formally declared this as a challenge affecting functions and activities in their jurisdictions.

El Nino has also affected other countries within the Southern African Development Community (SADC) region, particularly those who depend on South African for maize. Since then, R6.3 billion has been allocated to drought relief, an expense that could have been circumvented had there been adequate investment in infrastructure, as well as in appropriate planning across all industries.

In closing, he argued that it was necessary to move towards a more cost-reflective tariff to recover from the expenses and wastages that had previously been incurred. Tariffs could be used as a tool to incentivise behavioural change in people, the higher the tariff, the better users could understand the value of water and thus limit wastage. Furthermore, an independent regulator within the sector

is necessary for water and environmental regulation, however, the two must be separate. The water nexus with other sectors is reflected in the Master Plan and must be properly outlined.

The following policy recommendations were provided:

- ✔ A well capacitated economic regulator and Catchment Management Agencies (CMA) should be prioritised.
- ✔ The validation and verification process for water use should be improved.
- ✔ Water allocation reform should review the efficiency of agricultural water use versus the financial and economic value of benefits it brings to the economy.
- ✔ Improve the maintenance of existing water infrastructure across the entire value chain.
- ✔ Finalise the review of the Raw Water Pricing Strategy to set cost-reflective tariffs.
- ✔ Modernise network industries: finalise the process to establish an independent economic regulator for the entire water sector.

2.2.2 Building Economic Water Resilience

Gregg Brill, Deputy Director at the Department of Economic Development and Tourism, Western Cape Provincial Government

This presentation shared insights about the 2018 drought in City of Cape Town, highlighting the water management tools that proved particularly useful towards developing adaptive systems to the water predicament. These included updated data on water levels and predictions about usage. General dam levels have since significantly increased, though, some catchments in the Karoo and other parts of the Western Cape Province are still in crisis. Climate change projections show that Western Cape is expected to grow hotter, drier and windier over time. Changes such as these will directly affect government expenditure, resulting in sudden funding reallocation and rechanneling since drought and other climate change phenomena are not appropriately planned for.

The sentiments of previous presenters around the economic impacts of the water crisis were echoed with further expansion that they included reduced productivity, delays for other investments due to unplanned water infrastructure investments, increased cost of inputs and decreased competitiveness consequently, leading to profit loss, increased insurance premiums, employee retrenchment and food insecurity. Data and planning thus play an important role in strengthening economic resilience by mitigating future drought impacts on citizens and more broadly on the various economic sectors.

Amended water tariffs on the latter increase the risk of insolvency, adding to the general negative impact of water crisis on competitive advantage and the ability to secure external investment. Other mitigating strategies include business water consumption reduction, sector-wide water demand and supply gap analyses, onsite water reuse and developing incubators to improve the water sector.

In conclusion, the following strategies for the Cape Town water crisis were presented:

- ✓ Procurement framework changes need to allow for relatively new and 'untested' technologies & innovation.

- ✓ Regulatory certainty e.g. water efficiency, treatment and supply systems needed in new builds and retrofits. This can be done through by-laws and standardisation of triggers and actions for restriction levels across municipalities in the Western Cape and South Africa.
- ✓ Clarity and consistency in water pricing approaches across municipalities in the country.
- ✓ Capacity and resources - all tiers of government should share the risk of adapting to climate uncertainty and the added challenge of finding alternative financing mechanisms.

2.2.3 Water Resilient Cities

Luvuyo Manjo, Marketing and Communications Manager, Mandela Bay Development Agency (MBDA)

Mr. Manjo underscored that there were many contributing factors to water scarcity in cities (e.g. rapid urbanisation, resource constraints, etc.), arguing that cities were challenged by a multitude of issues including drought, air pollution and fragmented ecosystems which either contribute to or are a consequence of climate change. Moreover, reverberations of the apartheid regime are still manifest - there are high levels of inequality and continued segregation between races and classes across cities, exacerbated by the mismanagement of public funds and political instability (poor leadership that results in the inability of technicians and practitioners to fulfil service delivery mandates).

In closing, he posited that all the aforementioned issues needed to be addressed in order to effectively respond to climate change and that it was important to encourage active citizenry and a sense of individual responsibility towards climate related issues. This can be done by improving stakeholder access to information and public participation in policy development and decision-making.

2.3 INTERNATIONAL BEST PRACTICES

2.3.1 Localising the New Urban Agenda

Geoffrey Bickford, Programme Manager: Built Environment Integration, South African Cities Network (SACN)

This session provided an overview of the New Urban Agenda (NUA) and the Integrated Urban Development Framework (IUDF), highlighting their role in infrastructure planning and development.

The New Urban Agenda (NUA) is a global compact for guiding sustainable development and was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat

III) in Quito, Ecuador, on 20 October 2016. It responds to urban issues, specifically the injustices that are in urban areas such as socio-spatial and economic inequality. The difficulty to plan and respond to these issues and to rapid urban growth, necessitates a change in patterns of consumption and development. The NUA sets principles on what sustainable development and resource efficiency are at a global level, focusing on national urban policy, financial planning and implementation. It also seeks to elevate the idea of the “right to the city”.

In South Africa, it has been localised through the Integrated Urban Development Framework (IUDF) which seeks to, amongst other things, challenge the patterns of consumption in land, water and other resources. The

IUDF is South Africa’s first urban framework and was developed through a partnership with the Department of Human Settlements and COGTA. The IUDF was developed to determine how to go from broad urban principles and intentions to local level implementation; it stresses the importance of the urban while breaking the rural-urban divide through what the document classifies as levers. The IUDF recognises sustainability as a cross-cutting lever, however, it has yet to be adequately embedded. Water, as an element of sustainability falls under the fourth lever of the IUDF. There are Sustainable Development Goals (SDGs), the NUA, the Built Environment Performance Plans and many others, but as other presenters have argued, there is very little implementation. It is through implementation that the IUDF can be assessed to determine whether it covers all the principles of the NUA. These principles are anchored by five pillars, namely:

- ✓ National urban policies around governance
- ✓ Rules and regulations in land
- ✓ Urban planning and design
- ✓ Investing and financing core urbanisation functions
- ✓ Local implementation in cities

A governance partnership between local, national, and provincial spheres is necessary to implement the NUA, but more importantly, to bring together all government sectors and those outside government. The presentation concluded with a discussion about the IUDF’s conceptual framework, which was designed to assess whether the IUDF covers all the relevant urban principles. The framework covers awareness, alignment, association, actors and activities.



The discussion about the framework revealed:

- ✔ There is an alignment gap between planning and design: NUA pillars do not talk about financing implications i.e. in relation to property rates and spatial issues.
- ✔ The water sector is directly affected by the lack of spatial alignment: (re)location of people affects service provision (water and sanitation distribution).
- ✔ The notion of the right to the city has not been constitutionalised in terms of access to services such as water and sanitation, housing, health and economic opportunities.
- ✔ Economic access (in response to right to the city) is poorly defined in local municipalities.
- ✔ Municipalities do not hold much power to really drive local economic development.
- ✔ Awareness of IUDF and NUA has not been created, e.g. while many at this learning event are actors in the urban space, they do not know about these urban policies.
- ✔ In terms of associations and actors, who is the IUDF mobilising?
- ✔ How can a cohort of stakeholders be mobilised to actively play a role and to act in response to the IUDF as an urban agenda and policy?
- ✔ Other critical issues to note:
- ✔ Monitoring and evaluation are fundamental. It is known that project implementation takes long in cities. Why? What is being learned from the constraints?
- ✔ Partnerships are critical - across different spheres and sectors.
- ✔ Political cycles, municipal cycles and national agenda do not align How can this be resolved?

2.3.2 Water Security Planning - Learning from Lusaka, Zambia

Brenda Mwalukanga, Coordinator, Lusaka Water Security Initiative (LuWSI)

The Lusaka Water Security Initiative (LuWSI) is a multi-stakeholder forum supported by IWaSP/NatuReS to mobilise partnerships between public, private, civil society and international groups for water security in Lusaka. IWaSP/NatuReS works within a Water Risk and Action Framework (WRAF) in projects comprising of five

key elements that focus on; preparation, assessment, commitment, actions, and scale and exit.

The Itawa Springs Protection Project was implemented under the WRAF and ran between 2012 and 2016. It brought various actors together (approximately 25 partners) to protect the springs from encroachment and densification. Throughout its course, the project impacts have included the ecological restoration of 7,000 indigenous trees; the structural development of a pump-house, a water tank, 3 water kiosks, drains, an improved swimming area; the development of a community development centre, and approximately 2,400 new indirect jobs. The success of the Itawa springs project demonstrated three main points: the critical need for knowledge transfer within the country, specifically from north of Zambia to Lusaka; the importance of making a convincing case for business investment in water infrastructure; and the need to recognise private and public sectors as critical welfare actors in the city.

Another valuable outcome of collaboration was that LuWSI developed an action plan for managing current and future water sources. The action plan is intended to deliver high impact projects, improve understanding about water issues, inspire change, and strengthen collaboration across different sectors.

Through this, LuWSI has been able to deliver the following outputs:

- ✔ Wellfield Protection Project
- ✔ Think Act Be (TAB) Smart Project
- ✔ Lusaka West Water Supply Project
- ✔ Future Resilience for African Cities and Lands (FRACTAL)
- ✔ Water Security Action and Investment Plan

In addition to the outputs, a study was done, entailing hydrological mapping using different governance resources such as local planning. This was done with the community in an effort to improve the protection of water resources. A significant output of this was free access to the internet for the community - particularly the digital atlas which provides evidence of the processes of the action plan.

The study also looked at developing high impact strategies. This further demonstrated LuWSI's efforts to bring together different groups to play an active role and to actualise what was in the Water Security Action and Investment Plan.

2.3.3 Water Security Planning in Kampala, Uganda

Jude Zziwa Biansi, Manager: Waste and Sanitation, Kampala Capital City Authority

Kampala has a population of 1.5 million which is estimated to increase to approximately 4 million during the day as people carry out business and other activities in the city. It is also urbanising at a rate of 5.2% per annum. Less than 10% of the population resides in formal settlements, the majority of the population residing in informal settlements thus have limited access to formal water and sanitation infrastructure.

The Kampala City Centre Authority (KCCA) has thirteen municipalities. It does not function as local government, rather it manages the city on behalf of the central government and is mandated to:

- ✔ Maintain the city (clean and provide appropriate general sanitation)
- ✔ Deliver clean water and sanitation
- ✔ Mobilise local revenue of service provision

There is a water utility for national water, while the KCCA chiefly administers sanitation services. Kampala relies on water from Victoria Lake, springs, boreholes and rainwater harvesting. Approximately 97% have access to this water. However, pollution of Victoria Lake predominantly by defecation is increasing as less than 10% of the population in the informal settlements are connected to sewage lines and many people empty latrines into the lake. The KCCA collects faecal matter from latrines with the use of faecal slides that deposit the matter into drums, however, collection efficiency is only at 44%. Moreover, the KCCA has a 58% solid waste collection rate.

In order to respond to this, but more importantly due to resource constraints, a sector wide approach to partnerships was adopted. Multi-stakeholder platforms that address water and sanitation in the Greater Kampala Municipal Area, including for instance, the Mayors' Alliance, private sector and religious leaders, were formed.

The presentation emphasised that in Kampala, water was promoted as a business entity, and that prepaid water metering was a common practice in the city. Other strategies to address water and sanitation challenges (stemming from and complementing the abovementioned partnerships) included partnerships with the private sector around policy formulation and implementation; a taskforce that addressed discharge of untreated water; innovative ways of collecting faecal matter, particularly from informal settlements where access is limited; and a call centre where requests for collection can be made, in an effort to improve collection efficiency.

2.3.4 Regulatory Approaches and an Independent Regulator

Alma Porciuncula, Team Leader, USAID WASH-FIN Project Philippines

In Metropolitan Manila, 87.68% of the population has access to safe water services, 44% of this population has access to piped connections, 4% has access to sewage - predominantly in the capital region, and 74% of that has access to safely managed toilets. While the Millennium Development Goals (MDGs) were achieved, the SDGs have not. About 700 Php million, approximately \$14 million, is required to reach 95% and 97% basic access to water and sanitation by 2022, respectively.

One of the key challenges in Metro Manila is poor economic regulation in the water sector. As a result, water financing has been through a mix of public funding, and public private partnership funding (PPPs) and a current move towards rationalised funding. The latter refers to a unified funding framework that ranges from technical assistance to credit financing.

Disaggregated water providers in Metro Manila include the local government, which relies on the community, water districts which function as decentralised government structures and the private sector which performs better because it is regulated contractually. There are approximately 4000 water utilities that self-regulate, however, there are overlapping functions between water service providers and regulators due to conflicting mandates and targets, resulting in inefficiencies. There is an economic regulation institution, however water is neglected.

2.3.5 Dar es Salaam experience with C40 Cities Finance Facility, Tanzania

Grace Mbena, Coordinator: Environmental Planning and Management, Dar es Salaam City Council;

Fridtjof Behnsen, Country Coordinator Tanzania, GIZ NatuReS

Infrastructure development in Dar es Salaam is disproportionate to the rapid urbanisation taking place in the city. This, in addition to climate change has resulted in floods and inadequate solid waste management. Solid waste management is the responsibility of the five municipalities within metropolitan Dar es Salaam, in partnership with the private sector and community-based organisations, all of which are coordinated by the metropolitan council. Floods affect a sixth of the city's population (predominantly those residing in informal settlements) and have resulted in property losses to the approximated value of \$150 million in 2018 alone.

Only 40% of households in the city have access to waste collection, while a large proportion of households - mostly located in informal and un-serviced settlements - dump waste into the rivers. Other reasons for crude dumping include the prevention of erosion of riverbanks and land reclamation.

Through the assistance of C40 Cities Finance Facility, World Bank funding was secured to respond to waste mismanagement and the pollution of rivers. The City, through these partnerships, targeted five rivers as key areas for interventions such as land reclamation and redevelopment, public greening and water channel restoration. The flood prone Msimbazi River Basin was one

of the identified areas for intervention. The plan focused on 57ha that were to be reclaimed and redeveloped to include a restored channel, after terracing and improvement of green public spaces.

This project was undertaken through a participatory process called the Msimbazi Design Charette, which brought together multiple stakeholders across different sectors.

2.3.6 Introduction to C40 Cities Finance Facility parallel session on Day 2

Aris Moro, Knowledge and Partnerships Manager, C40 Cities Finance Facility

The presentation emphasised the C40 Cities Finance Facility's (CFF) role as an organisation that gives a voice for cities on an international platform. It provides a platform for exchange of best practices and provides technical support. The majority, (60%), of its member cities are in the Global South.

C40 CFF recognises cities as possessing the scope and willingness to address climate change issues, but unable to ensure that projects are bankable. It thus closes the gap between cities and financiers. C40 CFF does not direct or specify projects, but rather helps Cities mobilise funding and catalyse actions.

Some of the notable Global South projects include:

- ✓ Bangalore electric bus project
- ✓ Tshwane cycling project
- ✓ Dakar water basin restoration project with a water management component
- ✓ Durban scaling up of community run waste removal cooperatives for riverbanks

C40 CFF's parallel session on day two of the learning event showcased what Durban has been doing around climate change and the impact of shifting mindsets towards project progress. Although the parallel C40 session was guided by Durban case studies, it was an open platform for dialogue for other cities to share their experiences.

PANEL DISCUSSION: International Best Practices

The following points were raised during the closing session of the first day:

- ✔ How the multiple partnerships in LuWSI were sustained and which ones were instrumental.
- ✔ How LuWSI was structured - whether it functioned as an NGO and whether money flowed through LuWSI or directly to the businesses in the private sector.
- ✔ The coordination or leadership of the sustainability project in Dar es Salaam considering the multitude of stakeholders.
- ✔ There were clear power functions in LuWSI that South Africa can learn from - the factors that have influenced the success of the partnerships in Lusaka and whether the size of the area was of any relevance.
- ✔ There were various structures in LuWSI including three public institutions, two community organisations, two project knowledge committees and a steering committee. The steering board was elected to monitor risks and solve problems - chairperson of which is selected by the private sector. Partnerships with the private sector were formalised with MoUs. The flow of money went directly to the water utilities to ensure accountability.
- ✔ The KCC presentation around the impact of water recharge on the quality of the water itself and how environmental bodies reacted to the recharge.
- ✔ The provisions that allowed government to go into public-private partnerships in terms of the Kampala Capital City Act (KCC Act).

- ✔ The quality of Victoria Lake has been impacted by recharge. As a result, Kampala District receives water from another district while feeder swamps for Victoria Lake are being restored.
- ✔ The KCC Act provides an enabling environment that allows government to set up trading relationships with water utilities. Sanitation was the responsibility of the Ministry of Health, the Ministry of Education and two other entities, it did not have its own designated entity, resulting in bureaucratic problems for intervention.
- ✔ Stakeholders in the sustainability project in Dar es Salaam included local government, the Ministry of Land and the Ministry of Water, while Dar es Salaam City Council coordinated the project.

CLOSING REMARKS: Day 1

The presentations over the course of the day highlighted the economic implications of water scarcity and natural events such as drought, while also emphasising the importance of integrated and well-informed planning when developing infrastructure and providing its related services. Related to planning and development, was the underscored need for a measurement tool, a kind of “Water Resilient Cities Index”, like the smart city’s measurement tool, which can help with monitoring and benchmarking.

Furthermore, the sustainable management of water sources and services requires collaboration between businesses, the public sector, civil society and oftentimes, international aid. More critical is the need to change attitudes and behaviours around water both at the individual level and the organisation level.





DAY 2: SUMMARY OF PRESENTATIONS, BREAKAWAY SESSIONS AND PANELS

3.1 REVENUE GENERATING PROJECTS AND THE CIRCULAR ECONOMY

3.1.1 Water-Energy Nexus

Marlette Balmer, GIZ SAGEN

Ms. Balmer noted that the water-energy nexus is the relationship between how much water is used to generate and transmit energy, and how much energy it takes to collect, clean, move, store, and dispose of water. Electricity remains one of the most income generating commodities for municipalities (20% - 40% of their annual income), and electricity prices increase continuously for consumers. However, Cities are in significant arrears with the national utility Eskom.

The supply of water and wastewater treatment can potentially add up to 70% of the total energy consumption in a City, leaving 30% to be shared amongst other industries and communities. Ageing infrastructure adversely affects energy efficiency as some of it is lost by not using newly developed systems.

She stressed that there was an increased interest in installing new systems however, procurement processes within municipalities make it difficult to effectively address energy wastage.

3.1.2 Sludge to Energy

Christelle Beyers, Specialist, USAID South Africa Low Emissions Development (SA LED)

USAID has provided support to the development of a national Climate Change Mitigation Strategy at subnational level through a Low Emissions Development (LED) Program. This program specifically supports municipalities in mainstreaming low emissions development in their operations through technical assistance and capacity building. Successful interventions have been carried out in Wolwerkloof by providing technical assistance to Cape Nature on mainstreaming LED, identifying opportunities for resource saving and improving green infrastructure. Another successful project was the Zeekoegat Wastewater

Treatment Works Combined Heat and Power (CHP), which was supported through a project and investment feasibility case. The technical and financial viability investigation supported decision-makers to reach well informed pronouncements on how to structure a sustainable CHP project.

The investigation provided three options of contracting:

- ✔ Equipment procurement, commissioning and hand-over within three years.
- ✔ Two-phased contracting where option one is the first phase (i) above, and the second phase entails a 2-3-year operating cost. Affordability of this option is considered low; however, USAID SA LED can provide a network of multiple stakeholders to help cities address this.
- ✔ MFMA Section 33 contracting - which provides a holistic approach for cities to operate and systematically budget and upgrade a semi-good waste facility over a period longer than three years.

The presentation underscored the importance of using donors opportunistically and directing investments (technical or monetary) into relevant areas and issues. Moreover, energy efficiency should be included in KPIs, covering management of energy sources as well as infrastructure. The latter should always be considered an asset, regardless of the condition, and should be valued as such by municipalities.

PANEL DISCUSSION: REVENUE GENERATING PROJECTS AND THE CIRCULAR ECONOMY

The following points were highlighted in the first interactive session of day 2:

- ✔ The flexibility within the current South African procurement system and the extent to which municipalities can piggy-back off each other's processes regarding section 33 or 46 to reduce timeframes.
- ✔ The ability to procure things easily and whether the Development Bank of South Africa can offer anything to that process.

- ✔ The untapped hydropower capacity in South Africa and the knowledge and case studies that exist. The importance of transitioning to the use of these case studies and identifying who or which institution should take the lead were also highlighted.
- ✔ The existence of internal resources to drive hydropower projects and whether municipalities consistently outsourced considering the general institutional constraints.
- ✔ The ease of sharing generic specifications across the metros regarding issues like maintenance schedules, employment equity levels, etc. to avoid municipalities having to create new tender documents all the time. It might be useful to consider transversal procurement.
- ✔ In addition to regulation and funding, the importance of finding a champion within the municipality to drive issues was raised.
- ✔ The importance of having a business case for hydropower - finance experts should be involved and work with technical drivers.
- ✔ The fact that municipalities need longer than three years to ascertain the viability of projects given the amount of time it takes to get approval and get a project out to tender.
- ✔ The issue of supply chain management officials not knowing enough about construction processes, timeframes, etc. making it difficult for technical staff to make a case for expediency.
- ✔ The importance of phasing technical assistance provided by a donor across planning, implementation and monitoring. USAID has ensured that a municipal official is involved at every technical or mechanical component.

- ✔ The fact that it takes approximately ten years to get an innovation up and running - four or five years of that are spent trying to get different types of approval from National Treasury. Procurement is bogged down by bureaucratic processes.
- ✔ The National Treasury perspective that institutions should coordinate and submit issues formally. Submissions are not always clear - is three years too short for a funding cycle or not?
- ✔ The DBSA's confirmation that it works with various partners but working with municipalities is made difficult by the red tape - inefficiencies and politics. The DBSA can help with project preparation without going through the procurement process.
- ✔ The integration of operational or maintenance funding into project budgets should be done up-front.

3.2 FINANCING MECHANISMS

3.2.1 Finance Session: Introduction and approach

Chris Serjak, Team Leader, USAID WASH-FIN

This presentation provided an introduction and overview of the subsequent presentations in the session from USAID WASHFIN partners and collaborators. WASH-FIN works and supports any water related organisation provided that the organisation's work is in line with universal goals. It aids with revenue collection through customer reform, transfers and guidance in the effective use of grants.

USAID WASH-FIN has partnered with National Treasury and the Department of Human Settlements, Water and Sanitation around finance interventions in municipalities.



3.2.2 PPP Lessons learned and a look at current experiences in South

Morné Edas, Independent Consultant at Mergence Investment Managers, South African Water Works (SAWW)

South African Water Works (SAWW) is a majority black owned private water utility group. It has recently acquired two of the oldest water concessionaries in South Africa, Silulumanzi (Nelspruit) and Siza Water (Durban). SAWW acknowledged the significant funding gap in the water sector, and highlighted that:

- ✔ There is a R333 billion funding gap over the next ten years
- ✔ There are 51 PPPs across the continent, with a few in South Africa
- ✔ There are 962 wastewater treatment plants in the country, 44% of which are in a poor condition
- ✔ 64% of households in the country have access to water

SAWW is an experienced water company with a reasonable record for fundraising, revenue collection, and billing. Silulumanzi and Siza concessions were established before the current public-private-partnership (PPP) framework and municipal laws, which make them relatively easy to operate. The concessions are responsible for water reticulation, billing and revenue collection, and potable and wastewater treatment in its municipalities. The presentation further highlighted that the viability of water management in the private sector necessitated transparency (as utilities are susceptible

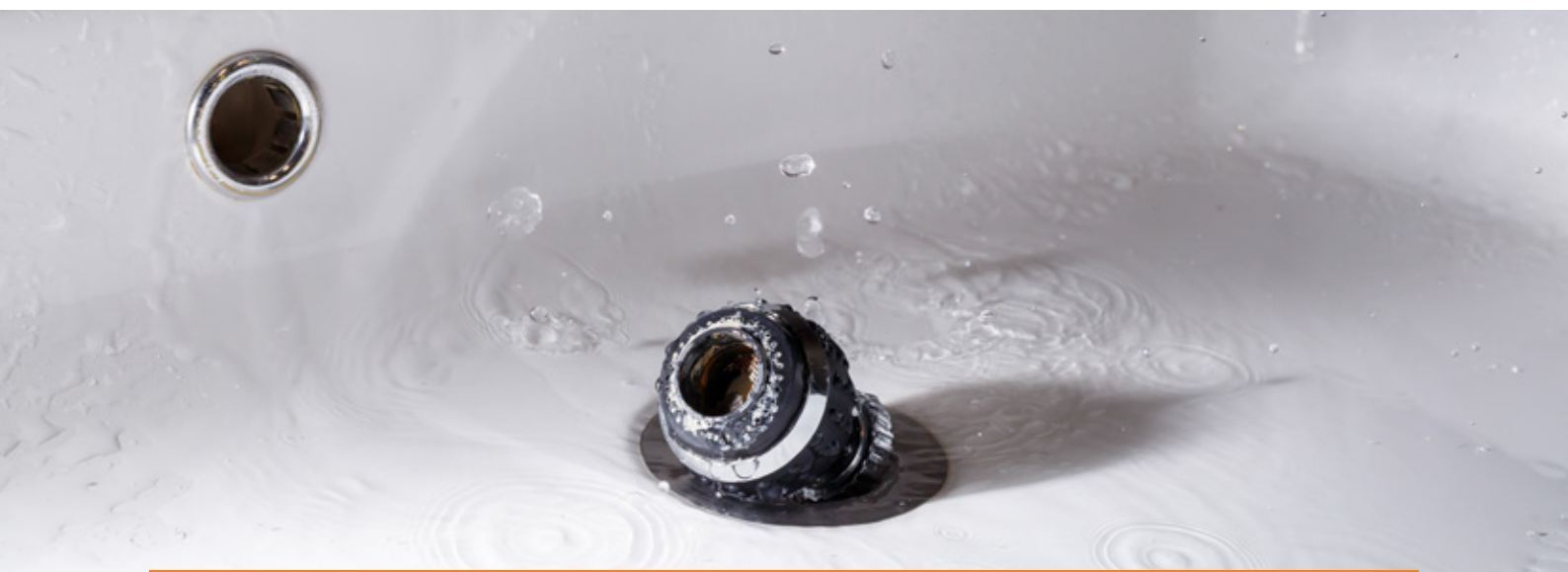
to media and government scrutiny), bankability and adequate technology. Moreover, concession monitoring by municipalities is critical, which can be done through KPIs. PPPs are a proven alternative to water management given that the private sector has more capital and is more willing to take risks.

3.2.3 Strengthening financial sustainability through efficiency and customer service improvement in Cape Town

Paul Bender, USAID WASH-FIN Project in South Africa

USAID WASH-FIN has a project with the City of Cape Town's Department of Water and Sanitation, which handles all water functions (reticulation, water treatment, revenue collection, etc.). Of the 900 City employees, approximately 16 are contracted and approximately 50% are outsourced, which impacts service delivery query responses.

The 2018 drought revealed that while usage was low, there were punitively high-water tariffs, made more so by inaccurate billing and metering. Moreover, query resolution was poor and drawn out, often taking years and garnering negative media attention. These issues were caused mainly by faulty meters, poor customer service organisational management and by the installation of Water Management Devices (WMDs), which were designed to control usage and mitigate debt. The WMDs were installed without customer engagement.



The above problems were resolved by improved billing for non-indigent households, customer query responses within 48 hours, accurate metering, the addition of experienced and senior advisors to help embed customer service across all work units and an action plan with objectives for all water units.

3.2.4. Water financing policy and mechanisms in the Philippines

Alma Porciuncula, Team Leader, USAID WASH-FIN Project Philippines;

Meredith Kummings, USAID WASH-FIN

There is a \$26 billion total investment requirement to achieve universal access to water and sanitation by 2030 in the Philippines. This target is to both increase the number of people receiving water and sanitation services, and to improve the quality of services. The Philippine financing experience entails:

- ✔ Public financing through grants
- ✔ Blended public-private funding which has been reduced, however private banks lend money to qualifying public water utilities
- ✔ Market-based loans from commercial banks
- ✔ Public-Private Partnerships through concessions, which are popular in Metro Manila

USAID WASH-FIN has recognised some of these funding approaches as periodic and has sought to rationalise funding, targeting for instance, subsidies as leverage. A Unified Financing Framework (UFF) has been developed to achieve 2030 goals - mainly rationalising public, blended public-private and market-based funding. The framework comprises of the following components:

- ✔ Technical Assistance Grants
- ✔ Efficiency Improvement Program
- ✔ Viability Gap Financing (VGF) based on affordability of tariffs
- ✔ Output-Based Aid (OBA)
- ✔ Credit enhancements

The presentation concluded with a comparison of the framework components, emphasising that sanitation services require more grants than water services, while

VGF would not work for sewage projects, given the expenses. Furthermore, VGF is a common tool in PPPs. It is awarded to private utilities but has limited focus on the performance of a utility. OBA is a microfinance tool that can be spread over several years and puts a lot more pressure on service providers to deliver quality.

3.2.5 Snapshot of multiple innovative WASH finance cases

Henry McGregor, Consultant, Pegasys Group

There is an estimated R333 billion water financing gap in South Africa over the next ten years. It is

important to diversify current financing sources, just as it is critical to improve water source mix.

Pegasys understands innovative financing instruments as:

- ✔ Institutional innovation that includes corporate social responsibility and water stewardship partnerships
- ✔ Innovative processes that look at water demand and asset management
- ✔ Innovative products such as microfinance revolving funding and debt, depending on how the latter is structured

An enabling institutional environment for innovative processes and products may include a regulatory framework that focuses on improving the procurement processes. Furthermore, the district development model might be of use in exploring how the above mechanisms be implemented locally. The presentation ended with an outline of the key WASH case studies that demonstrated innovative financing. These included:

- ✔ Columbia's use of the Findeter mechanism - a mixed economy corporation with PPPs. This mechanism is useful for municipalities who cannot access funding due to market failure. The mechanism can intercept grants to repay debts if the municipality fails to pay.
- ✔ In Kenya, OBA has been used to aid service providers, however, subsidies are provided on condition that there are progressive infrastructure or service developments as proof of credibility.

- ✔ K-factor, a 14-20% rate on water billing used to service debts. K-factor increases water tariffs to reduce demand. This mechanism relies on accurate water pricing and an enabling institutional environment.

INTERACTIVE SESSION: FINANCING MECHANISMS

In this interactive session, participants were split into four different groups, each tasked with determining innovative finance solutions and sharing them with the rest of the participants. Below are insights from each group.

Group 1: Adaptive funding is becoming increasingly attractive across the various sectors (transport, energy, etc.) and could make a significant difference in the water sector. Concessionary finance run by the International Finance Corporation (IFC) for retrofitting wastewater treatment plants is another innovative response.

Group 2: Rationalisation of costs for users is important and should be done through concerted efforts at communication. This can be done by establishing a unit that collects information to ensure that users know what options they have.

Group 3: Traditional borrowing from banks may still work e.g. commercial loans; as well as donor funding for low income countries that qualify for such aid.

Group 4: There is a mismatch between public and private sector demand in finance in that each sector has different issues. Water stewardship partnerships can help resolve issues such as poorly developed tariff structures.

3.3 Smart Cities

3.3.1 Smart service delivery

Ntshavheni Mukwevho, Managing Director, Joburg Water

Joburg Water is a municipal owned entity that is responsible for water reticulation and treatment for the City of Johannesburg Metropolitan Municipality. Key challenges experienced by the utility include aging infrastructure, lack of skills, lack of capital investment, high replacement costs of infrastructure due to non-maintenance at the necessary age, and customer service issues.

One of the focus areas of Joburg Water's smart service delivery is workforce optimisation. It has been recognised that existing technical skills are currently mis/under-used, resulting in delayed responses to queries. Workforce optimisation has therefore helped to streamline how foremen and other technical experts receive and respond to queries.

Joburg Water has adopted a "Citizen Centricity" strategic direction which seeks to establish an integrated dispatch centre where all water related queries will be routed and seen through telemetry, and then sent to foremen. It aims to provide end-to-end responses for service delivery through "uber-like" responses to water related queries where users or complainants can track the technician and the specified job on an app.

3.3.2 Using drone technology for data collection, case study from uMhlathuze

Siboniso Zungo, Acting Manager, uMhlathuze Municipality;

Dawid Dirk, Olepower

uMhlathuze Municipality has a revenue collection rate of 90% as a result of strict credit controls. It has International Water Association templates to assess water loss but cannot track unbilled water consumption. The municipality has therefore partnered with GIZ IWaSP and Ole-power to undertake a population count in order to ascertain the number of new settlements and structures that are connected to services but are unmetered.

Villages are not part of the municipality, however, over time the municipality has provided services in response to the growing demand. Rural expansion and the newly built student accommodation at the University of Zululand reveal that water use per capita in rural areas is high and unmetered. Technology is of significant relevance to the water sector as it can improve efficiency by digitising functions. Drone technology can be used to provide spatial evidence of what is happening on the ground and aid with monitoring. Drone technology was used to undertake a roof count in uMhlathuze Municipality, and the findings were adjusted to consider transient inhabitants in the rural areas, particularly university students who attend University of Zululand.

3.3.3.A framework for smart cities in South Africa

Engela Petzer, Council for Scientific and Industrial Research (CSIR)

The smart cities notion was placed on the presidential agenda in June 2019 and has been under scrutiny particularly due to existing challenges in South Africa around spatial integration, social cohesion, effective community engagement, etc.

The CSIR was appointed by GIZ to capacitate and encourage municipalities to join the conversation on smart cities. As such, it is devising a framework for a shared understanding of the concept.

In the early 2000s, smart cities used to be focused on e-governance but have, in recent times, been interpreted as high tech, green spaces. The focus has changed

overtime to reflect different interests and agendas. The presentation highlighted the importance of not allowing IT companies to set the agenda and add to the current ambiguity of the smart city definition. There is ambiguity in each key word, which results in controversial interpretation.

- i. “smart” - may refer to various loose digital concepts e.g. Artificial Intelligence, Big Data, broad themes on smart mobility, etc.
- ii. “city” - could refer to a satellite city linked to others, or the main or capital city.

The presentation questioned whether any of these interpretations were integrative, arguing that “smart” should not be prioritised over social development, but that technology should not trump other aspects that need to be considered in relation to smart cities.



Q&A SESSION: SUMMARY OF RELEVANT POINTS AND QUESTIONS

The following questions and remarks were made during the closing session of the learning event:

- ✔ A question was asked about the turnaround time for responses by Joburg Water and whether in the two-way communication, a complainant was notified about the status of their complaint if they do not have the Joburg Water app.
- ✔ A comment was made about the reaction of workers’ unions to the Joburg Water approach given the labour process implications of tracking employees.
- ✔ Turnaround time for queries is managed by City of Johannesburg metro municipality, not by Joburg Water. The system has been championed by the unions and employees as they have been engaged from the onset.
- ✔ A question was asked about how the Joburg Water intervention reduced overtime.
- ✔ Delays in the smart water tool have stemmed from procurement issues. This system hopes to optimise and increase efficiency, therefore reducing the amount of overtime work required. It will also make it easier to monitor operations.
- ✔ It was asked whether the safety of technicians in Joburg Water had been considered. In the NMBM experience, technicians became targets for muggings and other forms of crime when using technological gadgets.
- ✔ A clarification question was raised around drone use - whether post-processing software was used for analytics or if it was done manually.
- ✔ Drone technology is available for free online. Image stitching and analytics can be written in by the manufacturer or done manually. Drone technology has helped ascertain connections that need to be formalised and billed by municipality.
- ✔ A remark was made questioning whether drone data was significant enough to inform council decisions.
- ✔ It is important to integrate new technologies with the existing e.g. telemetry and remote reading.
- ✔ A question was put forward around the difference between the smart cities tool and tools such as telemetry and how smart cities can help in the water sector.

CLOSING REMARKS: Day 2

- ✔ A notable lesson from the learning event is that there are no shortages of skills and knowledge - South Africa is recognised as one of the top global innovators - however, it falls short at implementation. Reasons for poor implementation include protracted procurement processes, poor planning, and the mismanagement of funds and human capital.
- ✔ The presentations and discussions emphasised the importance of human skills optimisation, and a critical response to achieving this is by breaking down silos and working collaboratively. Moreover, it is important to promote an active citizenry that is conscientised and contributes to sustainable water management. The IUDF's key goal is to address this disconnect, and to systematically bring stakeholders together in urban planning and development.

- ✔ International lessons have demonstrated that PPPs are viable economic and regulatory options, but that they could also help improve community engagement and engender a sense of accountability in consumers.
- ✔ While procurement does indeed present challenges, the National Treasury has confirmed that there is financial support available, but that projects are often not billable. Revenue generation from water service provision services is low, however, adopting a circular economy approach presents useful opportunities to reduce the wastage of water and energy, through for instance, the sludge to energy conversion, hydropower, waste separation at source, etc. These strategies also address broader climate change issues.



























KEY HIGHLIGHTS

- ✔ The water management crisis requires coordinated implementation of existing policies.
- ✔ It is important to break the “hydro-illogical” cycle of reactive, panic-driven responses to drought, where lessons are not learnt, and risk mitigation measures not put in place.
- ✔ Risk-reduction opportunities exist in the circular economy approach through water reuse and recycling.
- ✔ There is a need to institutionalise water demand management policies and put in place cost-reflective tariffs to incentivise behavioural change among consumers.
- ✔ It is important to encourage active citizenry and a sense of individual responsibility towards climate change issues.
- ✔ The New Urban Agenda and the Integrated Urban Development Framework provide principles and guidance on sustainable infrastructure planning and development and should be used to stimulate cross-sectoral collaboration.



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-  Joseph Tsatsire, Senior Director of Water & Sanitation, Nelson Mandela Bay Metropolitan Municipality (NMBMM)
-  Ashraf Adam, Chief Executive Officer, the Mandela Bay Development Agency (MBDA)
-  Jay Bhagwan, Executive Manager of Water Use and Waste Management, Water Research Commission (WRC)
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-  Geoffrey Bickford, Programme Manager: Built Environment Integration, South African Cities Network (SACN)
-  Brenda Mwalukanga, Coordinator, Lusaka Water Security Initiative (LuWSI)
-  Jude Zziwa Biansi, Manager: Waste and Sanitation, Kampala Capital City Authority
-  Alma Porciuncula, Team Leader, USAID WASH-FIN Project Philippines
-  Grace Mbena, Coordinator: Environmental Planning and Management, Dar es Salaam City Council
-  Fridtjof Behnsen, Country Coordinator Tanzania, GIZ NatuReS
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-  Marlette Balmer, GIZ SAGEN
-  Christelle Beyers, Specialist, USAID South Africa Low Emissions Development (SA LED)
-  Chris Serjak, Team Leader, USAID WASH-FIN
-  Morné Edas, Independent Consultant at Mergence Investment Managers, South African Water Works (SAWW)
-  Paul Bender, USAID WASH-FIN Project in South Africa
-  Alma Porciuncula, Team Leader, USAID WASH-FIN Project Philippines
-  Meredith Kummings, USAID WASH-FIN
-  Henry McGregor, Consultant, Pegasys Group
-  Ntshavheni Mukwevho, Managing Director, Joburg Water
-  Siboniso Zungo, Acting Manager, uMhlathuze Municipality
-  Dawid Dirk, Olepower
-  Engela Petzer, Council for Scientific and Industrial Research (CSIR)

PARTNER ORGANISATIONS FOR THIS 3RD WATER RESILIENT CITIES EVENT

THE PARTNERS





4TH WATER RESILIENT CITIES LEARNING EVENT

Theme: An Exchange on Different Water Resilience Approaches in African Cities



The South African water sector's immediate and longer-term challenges require achieving a balance between addressing urgent water problems (which are often the immediate political priority) and the more strategic longer-term concerns that are raised by technical practitioners.

4TH WATER RESILIENT CITIES LEARNING EVENT

Theme: An Exchange on Different Water Resilience Approaches in African Cities

Date: 14 December 2021

Venue: Held as online webinar

INTRODUCTION

The 4th Water Resilient Cities Learning Event combined presentations from South African city officials who have direct responsibilities for water-related functions in their city administrations with those from officials from three African cities (Lusaka, Addis Ababa and Kigali) who have a formal focus on promoting resilience and, in two cases, have the formal title of ‘Chief Resilience Officer’.

This provided an opportunity to counterpoint the focus of and interaction between the operational water managers and the more generic resilience practitioners.

The introductory presentation considered responses to the South African water sector’s immediate and longer-term challenges. Often, this requires achieving a balance between addressing urgent water problems (which are often the immediate political priority) and the more strategic longer-term concerns that are raised by technical practitioners.

PRIORITIES AND TIME SCALES

One characteristic of most African cities is that they have to accommodate rapid population growth, mostly in low-income communities. This imposes a set of priorities on local administrations that must guide settlements, plan for the provision of public services and create conditions that enable livelihoods if not formal employment. These priorities offer their own opportunities to promote urban resilience, since approaches to service provision help to incentivise settlement in locations that are relatively secure (and the absence of services can discourage settlement in vulnerable locations).

Such opportunities can only be exploited successfully if they keep pace with the ‘demand’ imposed by growth and if they are associated with sufficient economic activity to sustain them. Although it was mentioned that sub-Saharan Africa’s urban population is projected to increase by 600 million people by 2050 and that the population of Kigali is expected to double over the same period, there was little reflection on the implications of these time scales and the resource demands imposed by such rapid urban growth.

The institutional challenge of promoting cross-sector, cross-scale interventions The South African city presentations from Johannesburg and Mbombela illustrated the pressures to focus on short term priorities but also the challenge of working with institutions that operated at different scales.

In both cities, it was recognised that long term interventions, involving major infrastructure investment, were needed to provide an assured water source to meet the demands of future growth.

In both cases, these investments were already running late which was constraining new development and exposing communities to growing supply risks. But perhaps because primary responsibility for the projects lay with national and regional institutions, the cities were not intervening to speed them up; they were concentrating instead on improving the performance of their distribution systems by reducing losses and seeking small supply increments from other sources.

A related challenge emerged from the non-South African city presentations. The ‘resilience officers’ had to find ways to identify and promote strategic approaches that crossed institutional scales and sectors within cities. Indeed, one definition of the role of the city resilience officer is “to facilitate communications across sometimes-significant internal divisions”¹ in city administrations.

For this kind of role to be effective in a large and complex administration, careful thought has to be given to the incentives and policy levers that the incumbent will have available to persuade other executives in the hierarchy to cooperate.

Although the presentations from Kigali, Addis Ababa and Lusaka dealt systematically with the broad challenges of resilience from a water perspective, it was not clear how a CRO could help to achieve goals such as, in Lusaka, to influence sub-division and land use change programmes that were seen as essential to support structured expansion and had support from influential sponsors in both private and public sector but might impact negatively on water resilience by polluting and/or overtaxing local groundwater resources; in Addis Ababa, to limit occupation of flood vulnerable lands while also ensuring a minimum standard of household sanitation provision to avoid undue pollution of urban streams; and in Kigali, to manage the provision of basic water and sanitation service infrastructure to new settlements across the city’s difficult terrain, given the difficulties in coordinating activities between national and local authorities and the dispersion of technical expertise between individuals rather than institutions.

All three cities shared with their South African counterparts the experience of significant financial constraints on any interventions to promote greater resilience that might require additional funding. In this regard, the presentation on Ethekewini/Durban’s Transformative Riverine Management Program provided particularly useful insights because it involved interventions across a range of (related) infrastructure as well as economic sectors but was organised to mobilise financial resources by optimising a set of collective benefits and was already able to demonstrate practical outcomes. The final presentation on ‘financing for resilience’ highlighted the important changes that are occurring on the economic front. Innovations in impact investing and climate finance are recognising that social impact and environmental and circular economy benefits merit concessional finance and this opens new doors for interventions that, in conventional terms, would not be financially viable.

¹ As per Michael Berkowitz, former President of the Rockefeller Foundation’s 100 Resilient Cities programme, see <https://www.rockefellerfoundation.org/blog/what-a-chief-resilience-officer-does/>

Lessons from Ethekwini's Transformative Riverine Management Program

This program seeks to improve the environment in the wider peri-urban area by rehabilitating natural streams in a manner that protects public infrastructure while generating income opportunities for local residents. The focus is ambitious since it potentially involves over 7000km of riverine corridors although presently only working along 400km.

The immediate practical goal of removing waste and clearing invasive plants from the river courses was to reduce the obstructions and blockages that led to flooding that damaged transport and stormwater infrastructure, imposing significant maintenance and replacement costs as well as putting communities at risk.

An important step in planning the programme was to identify direct financial benefits that could reduce the cost of maintaining the infrastructure since this could immediately justify the allocation of budgetary funds. Further benefits were achieved by organising the work on a community basis. This not only supported local livelihoods and entrepreneurship (through the formation of community cooperatives) but also ensured that there was community understanding of and support for the programme and its objectives.

Since the ecosystems of many of the city's streams have been seriously damaged, a further benefit from the programme has been ecosystem restoration. By reducing waste disposal into the coastal streams, the programme helps to protect the downstream reaches of the streams as well as the beaches, which are important social and economic assets.

The institutional framework of the programme also provides important operational insights. The core functions involved fall under the administrative leadership of the Ethekwini Municipality's Coastal Engineering, Stormwater and Catchment Management Department which in turn lies in the Engineering Unit Directorate which has responsibility for roads and conventional stormwater management.

“Because responsibility for many of the dimensions directly impacted on by the programme fall under the same leadership, it was easier to identify and coordinate the interests of different functions and optimise budget allocations.”

This is a good example of the way in which carefully designed interventions can have a transformative impact on the broader operations of the city. This was one of the approaches explicitly identified in the city's approach to building resilience which was outlined in its 2017 -2022 Integrated Development Plan (extract appended)

However, it remains to be seen how successful the program can be in expanding its reach and coordination outside the Engineering Unit to other functions that are institutionally separate but would be integral to a city-wide resilience programme. These functions include development planning, human settlements, parks and recreation as well as the 'trading services' of water supply and sanitation.

A further test will be whether it is possible to scale up the programme's activities to the point where they have significant impact on city-wide resilience while remaining cost-effective, to ensure that scaling is financially feasible.

RECOMMENDATIONS OF FOCUS AREAS FOR MARCH 2022 WORLD WATER DAY

- ✔ Future events could usefully focus on identifying resilience interventions that have shown the potential to be scaled up to keep pace with the rates of growth that African cities are experiencing and expecting.
- ✔ Equally important would be to demonstrate interventions that generate direct financial returns as well sustainable secondary social and economic benefits since these factors will determine whether resilience interventions are both financially and politically sustainable.
- ✔ A more considered evaluation of the opportunities and approaches to 'scaling up' is needed. Strategies or perhaps a formal 'theory of change', that explicitly links short term actions to long term resilience outcomes would help to strengthen the case for such initiatives. But this would need to be guided by an understanding of the institutional and financial constraints as well as careful analysis of the cultural preferences that often inform such initiatives.

- ✔ A further challenge is that many resilience interventions involve cooperation and coordination between institutions operating at different scales. Developing institutional reforms that encourage cross-sectoral cooperation and coordination is thus a further area that merits attention.
- ✔ Because of time constraints, eThekweni's approach to identifying transformative resilience interventions was not explored in the presentation but it may be helpful as a focus for a future learning event because it focuses on the underlying strategy of choosing potentially transformative interventions and considering how they may contribute at the scale required.
- ✔ At an operational level, it would be helpful to consider the institutional structures of urban administrations and the extent to which these support or hinder the necessary collaboration. One issue illustrated by the eThekweni example is the (common) separation of engineering services (roads, stormwater, streams) from water supply and sanitation services. Does this detract from the identification and promotion of water resilient development opportunities?
- ✔ Similarly, the structure of municipal financial administration should be reviewed. In most South African municipalities (just as in municipalities across the continent), the ability of citizens and service users to fund the costs of their basic services is already limited. It is thus critical to consider how interventions that enhance resilience will be financed - and the goal should be to find mechanisms that optimise the use of existing budget streams or that can be self-financing. The final presentation considered the challenges of financing interventions to strengthen resilience,
- ✔ So consideration should be given to new approaches to budget management. How could financial planning systems facilitate and incentivise cooperation within and between institutions? If there was an incentive bonus (an additional 10%) that could be allocated to 'joint ventures', it might help to break down institutional silos.
- ✔ Finally, special effort is needed to mobilise new streams of climate finance and impact investments to address the financial challenges of water resilience. The challenge here is to structure resilience interventions so that they reflect more closely the formal objectives of the concessional finance instruments. The objective must be to meet - and perhaps even influence - the evolving investment criteria to be more relevant to the water sector's needs.
- ✔ All the presentations offered useful frameworks and perspectives on the context within which urban resilience programmes have to operate.

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- ✔ Ondela Tywakadi - Principal Specialist: Water Services Regulation and Policy Development

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PARTNER ORGANISATIONS FOR THIS 4TH WATER RESILIENT CITIES EVENT

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- ✔ Smita Rawoot, Urban Resilience Lead WRI Ross Center for Sustainable Cities, World Resources Institute
- ✔ Amanda Gcanga - Country Lead for Urban Water Resilience Initiative & Senior Urban Policy Analyst, World Resources Institute (WRI)
- ✔ Marcie Kim, Project Coordinator and Research Analyst, Urban Resilience, World Resources Institute
- ✔ Meghan Stromberg, Urban Resilience Research Analyst & Project Coordinator, WRI Ross Center for Sustainable Cities, World Resources Institute

THE PARTNERS





5TH WATER RESILIENT CITIES LEARNING EVENT

Theme: Groundwater: Making the Invisible Visible - a Dialogue and Exchange on Innovative Approaches to Groundwater Management in African Cities



Improving the water resilience of African cities is increasingly becoming critical as the impacts of climate change, rapid urbanisation and unsustainable economic growth are increasing the number and frequency of shocks and stresses across the continent.

5TH WATER RESILIENT CITIES LEARNING EVENT

Theme: Groundwater: Making the Invisible Visible - a Dialogue and Exchange on Innovative Approaches to Groundwater Management in African Cities

Date: 30 March 2022

Venue: Held as an online webinar

INTRODUCTION

Improving the water resilience of African cities is increasingly becoming critical as the impacts of climate change, rapid urbanisation and unsustainable economic growth are increasing the number and frequency of shocks and stresses across the continent. To shed light on this important topic, the Water Resilient Cities Learning Event on 30 March 2022 promoted an exchange on groundwater - a water source that is increasingly being recognized and gaining importance as an alternative water source in addressing diminishing surface water but remains poorly understood and undervalued.

Many African cities are facing rapid urbanization, droughts, and other threats and challenges to their water supply and are increasingly struggling to meet their water demands. These challenges have led to a greater interest towards tapping into groundwater for building water resilience - a water resource whose integration into most cities' long term water resource management plans has been absent. While diversifying of water sources can be one of the measures for building urban water resilience, more attention needs to be given to the sustainable use of groundwater and to avoid turning to groundwater during a crisis in a rushed and unplanned manner, with limited knowledge about the use and management of this resource. In addition, protection of groundwater is often insufficient, leading to increased incidents of pollution.

Issues of integrated governance and management, pollution control, recharge, management of the reserve, and environmental requirements are pertinent to the sustainable use of groundwater. Compared to surface water, groundwater issues have an added level of complexity, given its nature of being hidden, unnoticed, less understood, and the links between the resource and users not being obvious. Given that groundwater increasingly plays a strategic role in building water resilience for African cities, in particular for cities that are not able to meet their water demands through surface water sources, there is a need for enhanced dialogue

on the new role of groundwater as well as sharing of innovative approaches towards its sustainable use and management.

BACKGROUND AND PURPOSE

African cities are increasingly exploring groundwater resources as an alternative and additional source to meet their rising water demand and become more resilient to droughts and the effects of climate change. The 5th Water Resilient Cities Learning Event intended to:

- ✔ promote and unpack the discourse around the use of groundwater for water supply
- ✔ discuss how groundwater can add to support cities' water resilience and what are challenges around its use
- ✔ highlight the innovative ways African cities are adopting to ensure sustainable management of groundwater sources in urban areas
- ✔ provide an opportunity for lesson-sharing among managers and practitioners for improved groundwater management in cities

KEYNOTE ADDRESS

For this, Eng. James Sauramba, Executive Director of the Southern African Development Community's (SADC) Groundwater Management Institute, provided an insightful keynote address on "Contextualising the significance of groundwater for sustainable conjunctive water resources management in urban areas in the SADC region" to set the scene of the event. To this end, he introduced the characteristics and challenges of groundwater use, gave some tangible examples of case studies from Dar Es Salaam, Tanzania, and Windhoek, Namibia, and promoted a framework for sustainable conjunctive use and management of groundwater.

SOUTH AFRICAN NATIONAL PERSPECTIVES

Subsequently, the event shed light on the South African national perspectives. **Dr. Moloko Matlala, Chief Director for National Water Resource Information Management at the South African Department of Water and Sanitation (DWS)**, highlighted the "importance and management of groundwater as a freshwater resource". He stressed the importance and potential of groundwater

for South Africa, but also emphasized that the knowledge around it in the country is not, yet, where it needs to be to make responsible use of this resource for increased cities' water resilience. The DWS aims at changing this to make the resource visible and bring government practitioners and other stakeholders to work together for its protection and use in a sustainable way.

Dr. Shafick Adams, Executive Manager for Water Resources and Ecosystems at the South African Water Research Commission (WRC) presented the "Research findings on the sources and management of groundwater". He emphasised that groundwater is a very localised resource that is not readily available all over the country and continent. Furthermore, groundwater has been promoted lately, but, unfortunately, often incorrectly as there is an imbalance between (drilling) technology and the scientific understanding of the source. Certain factors for a better utilisation are available (e.g. vision, resources) and certain things are already done correctly (e.g. procurement, drilling), while other aspects still need improvement (e.g. scientific approach, best practices, trained professionals).

This first session was then closed with a Q&A session facilitated by **William Moraka, Head for Technology and Innovative Projects** at the South African Local Government Association (SALGA). Questions circled around the "appetite" for groundwater and why there seems to be less attention for it, which are the hurdles to improved groundwater management, and the relationship between the Water Research Commission and municipalities in exploring groundwater potential.

SOUTH AFRICAN CITIES IN ACTION

The second session that was moderated by **Amanda Nyingwa, Technical Advisor at GIZ's Natural Resources Stewardship Programme (NatuReS)**, looked at "South African Cities in Action".

The first input by at the African Climate and Development Initiative (ACDI), University of Cape Town (UCT), and at the African Climate and Development Initiative (ACDI), University of Cape Town (UCT), presented on "Governing groundwater flows for growing cities facing drought risks". To answer the question "How can groundwater be sustainably governed in South African urban settings

now and in the future, in order to enhance the adaptive capacity of cities facing climate and urban changes?” they analysed the cities of Cape Town and Gqeberha regarding their urban water metabolism and hydrologic flows and developed groundwater governance recommendations. Particularly, they emphasized that collaboration between different stakeholders is important, for them not only to make groundwater visible but also legible and have the population care about its quality and supply. Only then can this precious resource be adequately protected.

Thereafter, **Ondela Tywakadi, Principal Specialist for Water Services Regulation and Policy Development** at the City of Johannesburg gave an “Update on the City of Johannesburg’s Water Security Strategy on groundwater initiatives”. He explained that Johannesburg is currently looking into diversifying its water supply sources to avoid a future day zero and is therefore exploring groundwater as an alternative source. For this aim, the city is conducting a study on available groundwater resources and hydro-geology data sources and characteristics by means of a data audit, while implementing the drilling of 27 new boreholes so far. He concluded that there is groundwater available that can be used for different purposes, but that it’s evident from the data that a decentralised approach is better than a bulk system. Further discussions with other private and government entities regarding access to groundwater sources are in the pipeline.

LEARNING ACROSS THE REGION

The third session, facilitated by **Amanda Gcanga, Country Lead for Urban Water Resilience Initiative & Senior Urban Policy Analyst** at the World Resources Institute (WRI), a global research non-profit organization, looked at learning across the region through examples from other African cities and their stance towards groundwater. **Kabisa Mwiyaluka, Engineer and Project Coordinator for Water Security** at the Lusaka Water Supply and Sanitation Company (LWSC), showcased the Lusaka West Groundwater Extraction Project in Zambia’s capital Lusaka. Lusaka’s water supply stems to 60% from groundwater. To meet the demands of the growing population while avoiding contamination, which is likely to spread fast across the city due to the geological formation of fast water flows, the city focuses on the identification of priority aquifers and wellfields for public water supply and how to best protect them. The multi-stakeholder partnership Lusaka Water Security Initiative (LuWSI) helps to protect the key water resources through empowerment processes of communities while also bringing the private sector on board. Furthermore, eco-parks around the wellfields are supposed to prevent encroachment and pollution of vital water sources. Finally, the city is following a more localised rather than a centralised approach in its groundwater use, by dividing the boreholes into zones according to their geology, which further helps to protect them.





Dr. Zablou Adane, Research Associate at the World Resources Institute (WRI), presented “Innovative and sustainable solutions for groundwater management in Dire Dawa” in Ethiopia, which is fully reliant on groundwater. The city is facing a groundwater decline, quality challenges, and data and infrastructure issues. Therefore, WRI explores innovative and sustainable solutions to balance the various water demands, improve the recharge rates, safeguard the water quality, improve treatment and recycling, and provide sustainable sources. Furthermore, Marc Manyifika, Country Lead for Urban Water Resilience at the World Resources Institute (WRI), re-evaluated “The Role of Groundwater in Building Urban Water Resilience in Musanze City” in Rwanda. The city is facing challenges due to a lack of knowledge on groundwater storage and its connectivity with surface water, as well as water quality degradation. To address these, opportunities around an underground network of caves, which are regulating the connectivity between the surface and groundwater, were identified. This included also the potential for stormwater management, flood control, inter-basin transfer, and recreational spaces for development in the city. Moreover, opportunities regarding water quality around ecological sanitary facilities development and nature-based decentralised wastewater treatment were discussed.

WATER FINANCING OPTIONS

The last session of the event focused on Water Financing Options. Johann Lübke, Disruption Specialist at the

Development Bank of Southern Africa (DBSA), shed light on “Blended finance principles and community water supply initiatives”. In order to address the issues the water sector is facing. There is a need for a programmatic approach to make the sector more investment-friendly and create partnerships between the public and private sector. To this end, the Department of Water and Sanitation (DWS) developed the National Water Programme with priority focus on non-revenue water reduction, water reuse, municipal infrastructure funding and agricultural water use/irrigation. Groundwater is considered as another potential programme. The plan is to prepare projects, facilitate and mobilise funding for the scaled implementation of projects by creating a centralized “centre of excellence” to drive preparation, facilitate funding and monitor implementation, as well as customising funding solutions to support the implementation of a specific asset class. The blended finance principles include credit enhancement, concessional and grant funding to crowd-in private sector funding, making use of debt capital market instruments with all funding procured on a competitive basis, programmatic approaches and finance options used to create specific and dedicated asset classes. Different programmes will have different funding options, structures and solutions. Such a standardised approach could also offer an opportunity to establish a groundwater programme as a sub-programme under the National Water Programme.

CLOSING REMARKS AND INSIGHTS FOR FUTURE EVENTS





Finally, Dr. Faith Lawrence, Country Coordinator for South Africa at GIZ NatuReS, closed the event by thanking the presenters for their insightful contributions and highlighted the significance of groundwater and learning from different experiences of cities, including their challenges, lessons, and innovations. She summarised the event by presenting the ten major insights she took away from the event:







- ✔ There is a need to build a case for conjunctive use of surface and ground water, as groundwater is an untapped resource and presents significant opportunities.
- ✔ Increased urbanisation means increased demand for groundwater options. However, this is not without challenge: pollution, poor operations and maintenance, increased as well as decreased ground water levels and poor water quality are all critical issues to be addressed.
- ✔ Data and evidence in support of deciding for various groundwater options are key.
- ✔ Understanding of the specific local context cannot be underestimated. This also means different approaches need to address an array of complex challenges in different contexts.
- ✔ The challenge of localisation means groundwater recharge is the responsibility of the user, but the necessary capacity is not readily available at the local level.
- ✔ There is a growing role for groundwater management and its strengthening in municipal governance approaches.
- ✔ There is a need to strongly promote collaboration, especially with regards to collective monitoring, as well as awareness raising.
- ✔ Regional cities have very different experiences concerning groundwater.
- ✔ Public-private-partnerships play a critical role in sustainably managing groundwater in the long term.
- ✔ Innovative financing and blended options are being sought and already available in the market in support of the water business.



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-  Eng. James Sauramba - Executive Director, SADC Groundwater Management Institute
-  Dr. Moloko Matlala - Chief Director: National Water Resource Information Management, Department of Water and Sanitation (DWS)
-  Dr. Shafick Adams - Executive Manager: Water Resources and Ecosystems, Water Research Commission (WRC)
-  Dr. Ffion Atkins - Postdoctoral Research Fellow, African Climate and Development Initiative (ACDI), University of Cape Town (UCT)

-  Dr. Anna Taylor - Urban Climate Adaptation Research Fellow, African Climate and Development Initiative (ACDI), University of Cape Town (UCT)
-  Ondela Tywakadi - Principal Specialist: Water Services Regulation and Policy Development, City of Johannesburg
-  Kabisa Mwiyaluka - Engineer and Project Coordinator for Water Security, Lusaka Water Supply and Sanitation Company (LWSC)
-  Marc Manyifika - Country Lead for Urban Water Resilience, World Resources Institute (WRI)
-  Dr. Zablon Adane - Research Associate, World Resources Institute (WRI)
-  Johann Lubbe - Disruption Specialist, Development Bank of Southern Africa (DBSA)

PARTNER ORGANISATIONS FOR THIS 5TH WATER RESILIENT CITIES EVENT

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-  Smita Rawoot, Urban Resilience Lead WRI Ross Center for Sustainable Cities, World Resources Institute
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-  Meghan Stromberg, Urban Resilience Research Analyst & Project Coordinator, WRI Ross Center for Sustainable Cities, World Resources Institute

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CONCLUSION

The Water Resilient Cities peer-to-peer knowledge sharing platform has demonstrated that the road is still long towards achieving water resilience in cities. What is needed along the journey are continuous conversations between different role players in the water sector. From city water managers, technical experts and practitioners, planners, policy and decision makers, to private sector and financing institutions, with clear linkages

with regional and continental counterparts and civil society organisations and communities, the message is clear - continuously devising opportunities for collaboration, for sharing innovative practices and approaches to enhancing water resilience in cities, while managing and addressing the ever increasing challenges of rapid urbanisation, unsustainable economic growth and climate change impacts - is critical to Africa's sustainable and resilient future.





PHYSICAL ADDRESS

JOBURG METRO BUILDING
16TH FLOOR, 158 CIVIC BOULEVARD
BRAAMFONTEIN
2017

POSTAL ADDRESS

PO BOX: 32160
BRAAMFONTEIN
2017

SWITCHBOARD

TEL: 011 407 6471
FAX: 011 403 5230
EMAIL: INFO@SACITIES.NET