



**Western Cape
Government**

Environmental Affairs &
Development Planning

BETTER TOGETHER.

Opportunities for decoupling economic growth from water use and triggering private investment: A green economy transition stocktaking thought



Sustainable Settlement Innovation Summit (SSIS)

20 - 21 February 2017

Goudini Spa, Rawsonville, Worcester

Rethinking the Western Cape's Water Future: Finding innovative solutions to conserve and re-use water BETTERTOGETHER

PREFACE

Balancing the Western Cape's Water System through "Options for decoupling economic growth from water use and triggering private sector investment: A Western Cape Green Economy transition stocktaking thought". Guiding implementation by all role players

Today, the test of any development objective is whether, and if so how, it preserves the available resources and opportunities available to future generations. This is particularly true of such a critical resource like water. One of the practical implications of this is, that even if one municipal regions (municipality) thinks they have enough from a transboundary shared water system? They actually don't have enough because their neighbours whom they share with will end up with too little/not enough. Water knows no municipal region/boundary and how its shared is paramount. "The impact of water on all aspects of development is undeniable: a safe drinking water supply, sanitation for health, management of water resources, and improvement of water productivity can help change the lives of millions."

Context: The financing and operation of water security infrastructure (*including location, design, and construction*) will have profound impacts on the Western Cape's resilience to climate change. This summit's discussion paper explored how the green economy, from a water sector perspective, through autonomous adaptation that balances the Cape water system will effectively assist in achieving the provincial development and job creation objectives as outlined in the Provincial Strategic Goals (PSGs).

Summit objective: Water is recognised as a central plank of the green economy. This summit will explore bankable water security project concepts using the "power of council" based on how municipal/public policy can be used to facilitate climate-resilient infrastructure, based on the experiences of practitioners, government officials and other experts. It focuses on "options for decoupling economic growth from water use and triggering private sector investment" through the lens of national policies and provincial initiatives that can be pursued in the Western Cape's sectoral green economies yet guiding implementation by all role players. The aim is to identify emerging examples of good practice (*that can be replicated in the Cape*), implementation levers and evidence on mobilising private sector investment in low-carbon, climate-resilient and green infrastructure backed by the private sector towards water security through complementary developmental and a risk-based approaches which seeks to manage risks and reduce vulnerability to shocks resulting from climate variability and lack of water-related disasters. In this summit's discussion paper, we argue that these two approaches are complementary, and need to be pursued simultaneously in a balanced manner covering all aspects of development – poverty reduction, food security, and health – and in sustaining economic growth in agriculture, industry, and energy generation.

The motivation for a green economy and inclusive green growth policies varies: the need to better harness natural resources for meeting basic needs, poverty alleviation, and providing sustainable livelihoods and job creation; the desire to mobilise resources and reduce burdens on public finances, while improving the environment; reduce vulnerability to

environmental shocks and natural resource bottlenecks; or the goal of fostering new growth and employment opportunities.

Implementing a green economy and inclusive green growth is a significant challenge. The scale of changes implies that provinces will have to take “transformational” actions that redirect investment flows within and across sectors. Isolated project interventions alone will not suffice. However, not everything has to be done at once. An important contribution that a strategic programme implementation framework can make is to help identify which interventions are urgent and which can wait; which can help address some of the immediate and critical challenges of water insecurity and which imply trade-offs.

There are important complementarities between a green economy, inclusive green growth and poverty reduction. These include: more efficient, reliable and expanded coverage of water and energy services; reduced the health impacts associated with environmental degradation; reduced costs and increased productivity from technologies that also ease environmental pressure. Given the centrality of natural assets in low to middle income countries, inclusive green growth policies can reduce vulnerability to environmental risks and increase the livelihood security of the poor.

This document does not provide a one-size-fits-all solution to implement inclusive green growth strategies and interventions for balancing the Western Cape’s Water System through “Options for decoupling economic growth from water use and triggering private sector investment”. Because the appropriate measures and policies are highly dependent on the context, especially on the most pressing environmental, social, and economic issues. Municipal regions will have different priorities depending on, among other, their income levels, the sectoral compositions of their economies, and the relative importance of sectors directly based on natural resources or with dependence on fossil fuels, and their specific risk and vulnerability profile from an environmental standpoint. However, if water sources are shared or transferred from one to the other, then the management and sharing of the limited finite resource become important from a systems perspective. The political economy of policymaking around green economics and green growth may also significantly shape the agenda in different municipalities. Hence, this document merely provides a series of tools that can help design interventions that are appropriate in a given context as outcomes from the summits technical Cape Cafés.

By publishing the outcomes of the Sustainable Settlements Innovation Summit 2017, we are continuing the systems approach we have already adopted to ensure sustainability and water security were water reuse, rain water harvesting and storm water harvesting has a role to play in the agricultural and urban sectors.

Approval of SSIS 2017 Post-Summit Report



RONALD MUKANYA

Director: Sustainability

Department of Environmental Affairs & Development Planning (DEA&DP)

Date: 27 March 2017

List of Acronyms

CoCT	City of Cape Town
DPR	Direct Potable Reuse
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EPWP	Expanded Public Works Programme
GDP	Gross Domestic Product
IDP	Integrated Development Planning
MFMA	Municipal Finance Management Act
PPP	Public Private Partnership
SANBI	South African National Biodiversity Institute
SuDS	Sustainable Drainage Systems
SWH	Storm Water Harvesting
UN	United Nations
UNEP	United Nations Environment Programme
WHO	World Health Organisation
WMARS	Windhoek Managed Aquifer Recharge Scheme
WRC	Water Research Council
WSD	Water Sensitive Design
WSUD	Water Sensitive Urban Design
WWTW	Waste Water Treatment Works

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Table 1: Summarised key summit outcomes on a "New Water Paradigm"

Summary of what's different under the new paradigm (adapted from the Rocky Mountain Institute, 1999)

Topic	Current Practice	New Paradigm
Water Use	Single use – water is used only once before treatment and disposal.	Greater emphasis is placed on water reuse and reclamation, use water multiple times (e.g. household greywater for irrigation), and reclaim treated water for the supply side of the infrastructure.
Water Quality (supplied)	Treat all supply-side water to potable standards.	Apply "right water for right use" – level of water quality supplied is based on the intended use.
Wastewater	After one-pass use, treat the resulting "waste" water, and return it to the environment.	Cyclical/"Close the Loop" – recognize the value in wastes": recover resources (reclaimed water, nutrients, carbon, metals and bio solids) for beneficial uses including potable water offsets, fertilizers, and generating power.
Storm water	Convey storm water offsite as quickly as possible with no regard for maintaining hydrological integrity of ecosystem.	Harvest storm water for water supply, irrigation, and/or infiltration benefits.
Increase System Capacity	Add capacity to water and wastewater facilities and collection/distribution systems as water demand increases.	Implement cost-effective demand side and green infrastructure before increasing grey infrastructure.
Type of Water Infrastructure	Primarily use grey infrastructure - engineered and constructed materials (pipes and treatment facilities and pumps).	Integrate the natural capacities of soil and vegetation to capture, infiltrate and treat water (green infrastructure) with grey infrastructure.
Centralised Infrastructure	Preference for large, centralized treatment and distribution systems that focus on economies of scale at the treatment facility without considering the whole system, which includes collections and distribution systems as well.	Favour distributed approach evaluating the spectrum from small decentralized systems to larger centralized systems, including combinations, based on local needs and the triple bottom line.
Complex Design	Administrative programs tend to favour more well-known (established), less complex, standard infrastructure designs and technologies.	Since today's problems cannot always be solved with today's standard solutions new technologies and strategies are encouraged (tested at demonstration scale as appropriate).
Infrastructure Integration	Water, storm water and wastewater are typically managed as separate systems (creating management "silos").	Water is water – integrate infrastructure and management of all types of water regionally, as appropriate.
Public Involvement	Stakeholders are informed when approval of pre-chosen solutions is required.	Stakeholders are engaged in the decision-making system from the beginning.
Monitoring and Maintenance	Water and wastewater facilities use computerized Supervisory Control and Data Acquisition (SCADA) to monitor and control processes.	Moves smart systems out to end users to provide real-time feedback regarding energy use and water use rates to build understanding, modify behaviour for higher efficiencies, and notify for maintenance.
Cost-benefit Analyses	Use estimates of capital and recurring costs as the primary quantitative factor for cost-benefit analyses.	Develop an understanding of the full cost and benefits of infrastructure. Including externalities.

DAY ONE: Monday, 20 February 2017

Session 1: Opening Plenary

Programme Director: Ms Karen Shippey

Chief Director: Environmental Sustainability

Department of Environmental Affairs and Development Planning

Western Cape Government

Ms Karen Shippey welcomed all the delegates, and highlighted in her greeting that the summit was about the opportunities for water and the opportunities for water reuse.

1.1 Opening and Introduction

Mr Piet van Zyl

Head of Department: Environmental Affairs and Development Planning

Western Cape Government

Mr Piet van Zyl welcomed all the delegates, and commented on the current water scarcity in the Western Cape. He said that this 4th Sustainable Settlement Innovation Summit comes at an opportune time with its relevant theme of 'water'. He said that current initiatives will be discussed, and explained that the provincial government has an interdepartmental task team on the drought, which has joined the City of Cape Town in looking at short-term interventions.

Mr van Zyl said that he was looking forward to the presentations, particularly from Namibia, as they have been doing something South Africa has been talking about for over 40 years. Mr van Zyl concluded by introducing Minister Anton Bredell.

“South Africa has been talking about this for over 40 years”

1.2 Welcome Address

Minister Anton Bredell

Minister of Local Government, Environmental Affairs and Development Planning

Western Cape Government

Minister Anton Bredell welcomed the delegates to the SSIS 2017. He reiterated that the discussion will revolve around water and, in particular, balancing out the Western Cape water systems. Minister Bredell highlighted that the average dam levels were below 35%, which constitutes a crisis, and noted that good rainfall can only be expected by July/August. Minister Bredell stated that he was grateful that people from Namibia were present to share their experience.

" average dam levels are below 35%, which constitutes a crisis,... "

– Minister Anton Bredell

Minister Bredell said that extreme weather events, like this current drought, are not going away and threaten food security and economic growth – both of which are crucial for South Africa. He said that our biggest problems in the country are poverty and unemployment and, without water, the economy won't grow. He said that government must be more proactive in addressing these concerns.

" without water, the economy won't grow,... " – Minister Anton Bredell

Minister Bredell pointed out that we have been in a dry period since a year and a half ago, and that five (5) areas have been declared disaster areas (Central Karoo, West Coast, Oudtshoorn, Witzenberg and Prince Albert). He felt that the situation is unlikely to improve over the next five to ten years. Minister Bredell argued that the focus should be shifted to sending out the right message. He believes that we will have to reimagine how the economy works and how we can work together across government, business and the public sector to address these challenges. This is critical if we want to improve the quality of human settlements, and the living and working environments of all people.

As MC Karen Shippey introduced the next speaker, she pointed out that while the topic under discussion is very important, she wanted to make sure that this occasion was used to optimize opportunities for the economy as well. Ms Shippey stated that what we have is a chronic condition that you live with for your entire life - you have to change the way you live in order to cope with the condition. Ms Shippey said that we have a chronic water stress condition, and we need to change the way we all live and function in our systems in order to respond to that.

1.3 Opportunities for Decoupling Economic Growth from Water Use and Triggering Private Investment

Mr Ron Mukanya

*Director: Sustainability, DEA&DP
Western Cape Government*

In his opening statement, Mr Ronald Mukanya said that he does not think the water issue is necessarily a finance question - the key message is that we need solutions on the table. He stated that our most basic needs are dependent on the weather, and the weather can't be controlled.

"Our food and water, our most basic needs, are weather-dependent. We must make significant investments in 'no-regret' solutions for improving local water storage and water access, and leapfrogging water insecurity" – Ron Mukanya

Mr Mukanya held that future planning needs to factor in drier conditions going forward. He said that we need to make better use of the good and reliable support available around all the modelling, and must integrate this into the current planning.

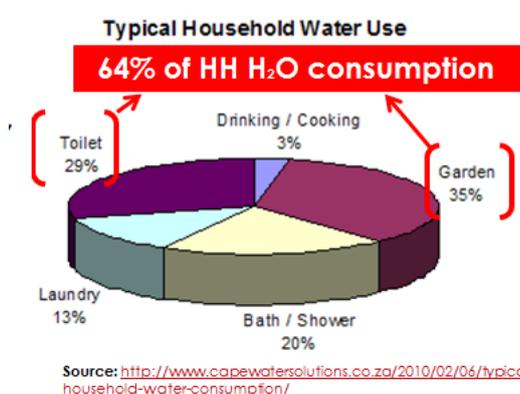
Mr Mukanya said that history shows these are the lowest dam levels we have had, adding that the average annual rainfall, mean annual runoff and mean groundwater recharge across the Berg and Breede systems will all decline projections suggest. We are likely to see a 20% drop in average annual rainfall and the impact of this would be water flowing through the region systems could fall by up to 24% by 2050, "LETS PLAN for this scenario".

Mr Mukanya said that in the Western Cape, only 8% of the land area contributes 50% of the water to our rivers. He noted that we have to be looking for water elsewhere and that temperature increases are also going to present a problem, citing evaporation, maintenance and operation costs as key issues.

Mr Mukanya showed a video of Cape Town Mayor Patricia De Lille, who said that the city is facing a water crisis as dams are below 40.2%. She stressed the fact that we only have 30% of water to use as you can never empty a dam completely - 10% must always be left in the dam. Mr Mukanya echoed the sentiments of the Mayor, adding that Cape Town is the biggest water consumer. He highlighted that the key focus points were technology, behaviour, and leadership as a mixed portfolio of solutions to address water insecurity.

Mr Mukanya asserted that reuse is an attractive option. He said that 64% of the household consumption of water goes towards toilets and gardening. He then asked whether we are using our potable water for the right functions and purposes.

Mr Mukanya explained that the Department of Water and Sanitation highlights the following points around water security: (1) rainfall and (2) water use. He believes that there is an opportunity to reuse more water and provide water in formal and informal settlements. He indicated that the potable water guzzling is essentially within the formal areas (i.e. middle to high-income households).



"In comparison, a low-income household has a dramatically different relationship with water. Potable water usage for toilets and gardening is very high and recycled Fit for Purpose water for Toilets and Gardening must be pursued as water reuse and recycling is a viable option " – Ron Mukanya

Mr Mukanya said that diversification and decentralised options are very viable. He emphasised that lessons have been learnt by looking around the world, such as in Namibia. He also mentioned coming across interesting interventions that the Australians did, and has

tried to superimpose and match some of them to a local context. In terms of water reuse and recycling, Mr Mukanya stated that it is a viable option.

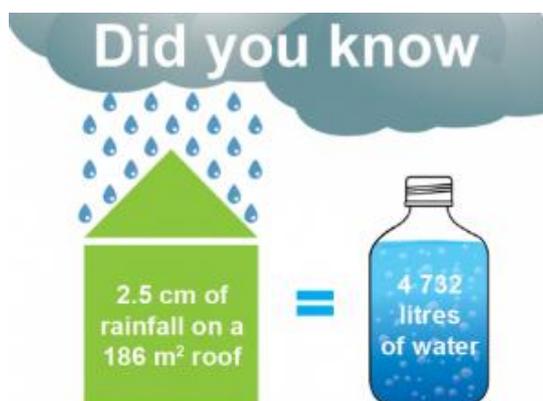
Mr Mukanya then showed a video of Minister Alan Winde from the Ministry of Agriculture, Economic Development and Tourism. Minister Winde pointed out that water is a big issue in this country, and outlined what has been happening over the past three (3) years in South Africa in terms of our towns and sustainability. He indicated that we need to be reusing and recycling as much water as possible. He reiterated the importance of recycling, reusing and creating sustainable communities.

" we need to be reusing and recycling as much water as possible,..." – Minister Alan Winde

Mr Mukanya said that desalination is an option but should be the last resort: looking at the volumes, desalination does not make any sense as we can improve our efficiencies and achieve volume gains. He added that our development needs to be compatible with the climate, as Australia has done.

Mr Mukanya pointed out that nine out of the ten global catastrophes are connected to water. Mr Mukanya said that the latest reports (since 2012) indicate that the government will never have enough money in the next ten to twenty years. Related to this, the role of the private sector is well-documented and identified in the reports. Mr Mukanya stated that spreading the costs, in terms of managing the risk and ensuring long-term sustainability, and engaging with the private sector, can allow the gap to be filled.

Municipal by-laws permitting and incentivising proactive action, "the current water challenge that the province is facing provide an opportunity for households, businesses and industry to invest in water solutions". I see water constraints as opportunities for the green economy, where Western Cape water service and technology providers are able to meet these market needs and one just needs to enable them through a coherent conducive environment – Ron Mukanya



Mr Mukanya emphasised that commercial and industrial reuse options are very attractive, and noted that there are some organisations that are already active within that space. He pointed out that there are some fascinating examples, such as a project in Durban that came online in 1999: they freed up enough potable water for 75,000 households, so it can be done and it has been done.

Mr Mukanya also emphasised that successful rain water harvesting can contribute significantly to easing the pressure on our dams in the rainy season, which will give our dams a chance to recover. The bigger dams should only be the "storage battery" for when there is no rain.

" Water re-use systems ("purple pipes") have been very successfully implemented in many countries with appropriate controls & safeguards, " – Ron Mukanya

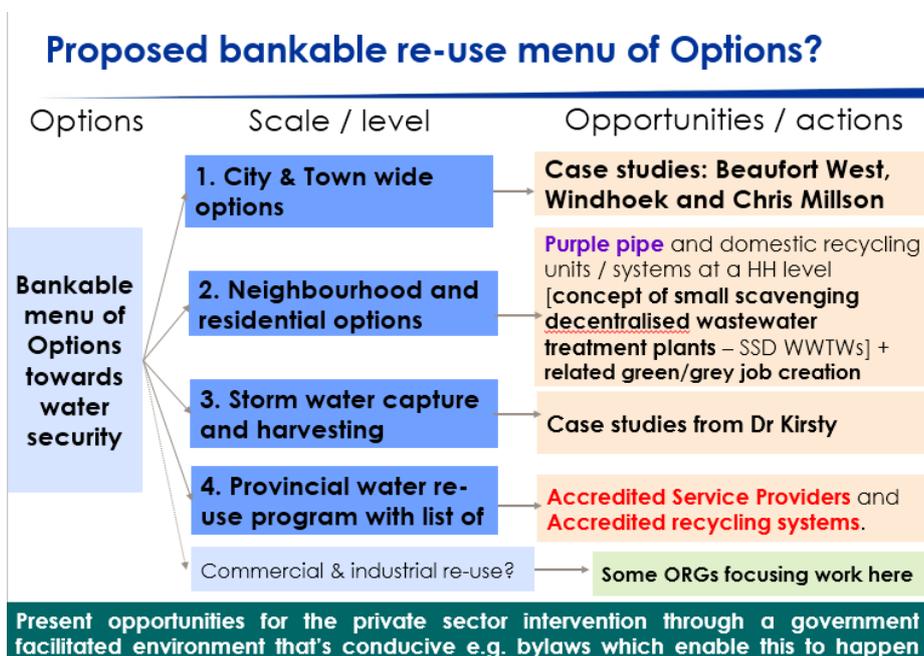
Mr Mukanya said that 'purple pipes' have been very successfully utilised in many countries with appropriate controls and safeguards. He suggested that accredited service providers and accredited recycling systems are what we need so that there is control on appropriate technologies and installations from a provincial point of view.



Water re-use systems ("purple pipes") have been very successfully implemented in many countries with appropriate controls & safeguards.

The above combined with on-site treatment and re-use implies we can go for very, very long before talking "desalination" which he termed is bottled electricity and has high CAPEX and OPEX cost implications. We're dumping millions of litres of fresh rain water into the sea, then we dump treated effluent into the sea as well – millions of litres per day which we are forgoing and not optimally utilising, then we want to desalt sea water through a very expensive process. Why not fully utilise these volumes without any sea salt in them first through very cheap low tech options that are available at household and neighbourhood scales?

...“desalination” is bottled electricity with very high CAPEX and OPEX cost implications. Like with solar hot water geysers, we must first increase the uptake of available cheaper low tech options that are available on the market at household and neighbourhood scales for combined on-site waste water treatment and re-use..... – Ron Mukanya



Mr Mukanya said that preliminary results suggest that 30% could be saved by simply switching to drip irrigation systems and gravity-fed irrigation systems. He noted that there is a lot happening in the middle stream, such as clearing alien vegetation, which is important as it saves 4 - 14% of water losses. However, he also mentioned that "it's not the be all and end all as it doesn't fill up a half empty system, which is our problem right now".

Mr Mukanya spoke about the 'State of the Bay' report, noting the issues around sewage and storm water, and adding that if they used 'purple piping', there would be an opportunity to solve those problems and the industries there would foot the bill. Mr Mukanya said that if you stay out in Green Point, Mouille Point or Hout Bay, all the water is being churned out into the sea. He suggested that this water could be held back through these systems and reused. Mr Mukanya acknowledged that there are serious knock-on impacts towards agriculture and food security, and the decision-makers need to factor in these issues when coming up with wise investments. He added that in the next 3 - 5 years, we will not be out of the woods just yet, unless we start doing something now. Mr Mukanya then showed a video titled 'Bay of Sewage'. The video exposes the sewage crisis in Cape Town's oceans: every day, millions of litres of partially and/ untreated waste water is being discharged from the Camps Bay region into South Africa's marine reserve. Marine conservation photographer Jean Tresfon first brought the crisis to public attention. Swimming in the ocean could be a health hazard. Mr Mukanya then concluded his presentation.

...“ for example the millions of litres of partially and/ untreated waste water being discharged from the Camps Bay region into South Africa's marine reserve can be held back through these household and neighbourhood scales' systems and reused at source. A simple arithmetic on the 20,000 CoCT guzzlers with say 15,000ℓ systems easily gives us 300 million ℓ's of fit for purpose water that's available available in and around the city's region. This water can be purple piped and used for toilet flushing and gardening / lawns which when combined consume 65% of an average households potable water consump. This will free up more potatble water and improve water use efficencie like the 1999 Durban water project highlighted above... ” – Ron Mukanya

1.4 Overcoming Water Reuse Barriers

Mr Pierre van Rensburg

*Strategic Executive: Infrastructure Water and Technical Services
City of Windhoek: Department of Infrastructure Water and Technical Services*

Mr Pierre van Rensburg began his presentation by explaining that the central areas of Namibia get the bulk of their water from the dam and, because of the current levels, there was a probability that they would not be able to make it through two rainy seasons. In April/May of 2015, they held the CAN (Central Areas of Namibia) workshop to examine their water supply and see if they could bridge two years, as they are very reliant on rainfall.

Mr van Rensburg said that they experienced a drought in 2015, and there was no previous plan to fall back on - they had to start from scratch. They immediately began with water demand management. He noted that having a plan is easy - getting it approved by council is the difficult part. Mr Van Rensburg explained that the plan was implemented in December 2015 and, one year into their water demand management regime in December 2016, it proved to be working well.

Speaking specifically about commercial industries, he noted that they discovered that 95% of the savings achieved were only efficiency gains; they didn't really cut back on

production. Mr van Rensburg stated that in the 2015/16 season, they had 2% inflow in all 3 dams: by August, the first dam was empty and by September, the second dam was empty. They implemented an emergency system on 16 December last year - 25 days before the predicted run-dry date of the dams. He noted that they are now where they were more or less a year ago in terms of total volume of supply, but the situation is still fairly critical.

Mr van Rensburg said that he would approach his presentation topic, 'Overcoming Water Reuse Barriers', from a global perspective, adding that water scarcity is not only a problem in the Western Cape or in Namibia - it's a global problem that is gaining prominence. Reuse is a possible solution. He said that you find very few cases of reuse, specifically potable reuse, in the world.

" Windhoek has been pursuing potable water reuse for 50 years. The project was compared to Doctor Chris Barnards' heart transplant in terms of its potential for changing the world, but very little has happened outside Windhoek. Something is preventing people from taking the plunge, ... " – Pierre van Rensburg

Mr van Rensburg said that the outlook is bleak in terms of water security everywhere, and people need to start thinking differently about this issue. He pointed out that the UN published a report last year where they predicted that half of the global population will be facing water scarcity by 2030. He said that water will be such an issue in the future that people will be migrating because of water scarcity, and people will be starting wars because of access to water.

Turning to reuse and what is being done globally, Mr van Rensburg noted that the USA produces more than 60 billion cubic metres of treated waste water annually, and they reuse less than 4%. He reiterated that we have a global problem, and water reuse is a possible solution.

" we have a global problem, and water reuse is a possible solution... " – Pierre van Rensburg

Mr van Rensburg stated that Namibia is cut off from all the perennial rivers. He pointed out that Windhoek is a densely populated area, and the water supply for the city has always been challenging and is becoming more so as the population is growing.

Mr van Rensburg did some research and found that a lot of people knew about water reuse, yet no one was using it to its full potential. He pointed out that there were six points that came up all the time, namely:

- Technical solutions
- Health risks
- Public perception/acceptance
- Planning approach
- Real and potential economic considerations
- Regulatory/policy issues.

He explained that if you split the six points into two categories, the bulk of the issues lie in non-technical issues, and that is where the focus needs to be.

" in any reuse application, you need to know what you need the water for and what standard it should be, and then design the technology that can meet the treatment objectives. The use of membranes in waste water treatment has allowed more waste water to be treated reliably on a constant basis that can then be reused. Windhoek has been doing this for nearly 50 years: they developed strict water design criteria and looked at global water quality standards, as well as what could potentially be in the water that could pose a significant risk. ... " – Pierre van Rensburg

Mr van Rensburg said that there are many places in the world where they have water shortages, and they cannot physically get the water to a central point to enable it to be treated and redistributed as a reuse possibility. This is something to be looked at.

Mr van Rensburg stated that two concepts were developed: they aimed for maximum contaminant level, which means if something can be reliably measured, they set a standard; and decided that at all times they should keep contaminants below two (2) milligrams per litre. He pointed out that you cannot reliably measure each parameter that you want to cater for.

Mr van Rensburg explained that they split industrial waste water from domestic waste water to make sure that what enters the stream can be reliably treated. He said that they have outsourced their reclamation facility to make sure that it's outside the public domain. He emphasised that you need to identify causes of possible long-term health hazards - if you cannot prove that you are managing the health side of things, you will never get the public to accept it. He pointed out that new contaminants emerge all the time, and a study is being done on these antibiotic-resistant genes. He stated that they monitor the full water cycle, which means that they monitor from the point of waste water discharge right to the point of the consumer. He indicated that they don't only focus on the actual treatment, but also on the treatment steps.

Mr van Rensburg clarified that the long-term toxicity tests and virology samples are sent to South Africa, and those that cannot be done in the region are sent to Europe. There is a big cost involved, but it's very important to build the credentials that they need in order to take this forward.

Mr van Rensburg said that if you look at Windhoek, the biggest driver for reuse was that they had no alternatives, and the 'yuck factor' diminishes significantly at this point. He shared the results of a 2011 study:

- 93% said they drink the tap water.
- 90% said they think the water is safe and drinkable.
- 84% said they think the tap water is of excellent quality.
- Only 44% knew that treated waste water was being reused in the drinking water supply.

Mr van Rensburg said that was a big eye opener, and they refocused their attention to education and started with school groups. Mr van Rensburg emphasised that it is vital that the water department and sanitation constantly speak to each other. He said that Windhoek has additional reuse facilities, direct potable reclamation, a 'purple pipe' system for public facilities such as sports fields, a WMARS project, and they are using reclaimed waste water to recharge their aquifer. He added that in other parts of the world, you will find that reuse water is artificially priced. He stated that in Windhoek, they are selling DPR water at 30% lower than the cost of surface water. The same is true with their irrigation water; if they distribute it for commercial purposes, it's about half the cost, for public purposes, it's 75% less.

" its predicted that reuse will outgrow desalination in percentage and volume ... " –

Pierre van Rensburg

Mr van Rensburg shared that the World Health Organisation (WHO) is looking to establish a reuse guideline that can serve as a global reference; even though Namibia has been doing it for 50 years, they lack that formalisation. He said that there is a government reuse policy, and internal policies, but it's not written down and clearly published. In conclusion, Mr van Rensburg stated that it is predicted that reuse will outgrow desalination in percentage and volume. He pointed out that managing health risks is non-negotiable: if we cannot prove that the health risk is taken care of, then public acceptance goes out.

1.5 Beaufort West Water Reclamation Plant – Case Study of a Direct Water Reclamation Plant

Mr Pierre Marais (Pr Eng)

Water and Wastewater Engineering

Mr Pierre Marais engaged the audience by requesting that they grab the bottle of water on the table, smell and taste it. Once the audience tasted it, he announced that it was 100% sewage water. Mr Marais said that the water was not diluted or blended in any way. The focus of his presentation was not about the technology; he would be discussing the softer issues, the non-technical issues, because these issues make or break these projects.

" Beaufort West has a shortage of water, and having a water reclamation plant was part of the short, medium and long-term strategy. They did not do it as an emergency measure or emergency project. They started managing their water losses, installed prepaid meters, implemented water restrictions around ground water development, and redeveloped existing boreholes. He stated these were the first short-term measures, and they were successful, so they managed to extend the period before they started with the water reclamation plant. waste water reclamation was the next sustainable/affordable option as part of their medium-term strategy. He noted that there must be more emphasis on affordability because water costs R11/kilolitre in Beaufort West. The other process the municipality started was a public awareness campaign about reclaimed water, with ads discussing the matter at community level: long before they got involved in the project, the municipality had already started letting the community know that water reclamation was coming. ... " – Pierre Marais

Mr Marais reported that the next phase was to start with the EIA process, and that the process of the municipality was to put the EIA out for a water reclamation plant, which would take sewage water and treat it to potable water quality with the pipeline that crosses the river. He pointed out that the municipality had a complete open book policy and did public awareness about it - they didn't try to hide anything.

" another problem was Muslim religious concerns. However, the Water Research Commission did a study on Islamic prudence and conditions for acceptability of reclamation of waste water for potable use by Muslim users. The study showed that there's no religious objection. He suggested first exhausting all sources before embarking on the reclaimed water path ... " – Pierre Marais

Mr Marais explained that the 'yuck factor' was probably the biggest issue. Mr Marais stated that the role of the project was to optimize the performance of the existing waste water treatment works. The project was structured as a Design-Build and operate-Transfer (BOT) project: there was a public tender process where they had to tender for the design and operation of the project. They won the tender and designed it, and will operate it for six years. It is currently providing water of decent quality.

Mr Marais pointed out that an extremely important part of the project is a new rising main to the reservoirs for the blending of the different water sources. He added that they built a new rising main from the water reclamation plant in Beaufort West, all the way through town up to the reservoir, where there are three reservoirs. He stated that in the first reservoir, they receive their potable water from their conventional water treatment plant and from their boreholes. In the third reservoir, they pump in the reclaimed water, and then they blend it into the central reservoir and distribute it to everybody equally.

" technology has been debated at length, and spoke about various processes that included phosphate removal, settling, sand filtration, ultra-filtration, reverse osmosis, advanced oxidation (hydrogen peroxide/UV), and final chlorination (residual), explaining that all these bring the water up to the acceptable standard.... " – Pierre Marais

Mr Marais raised the issue of micro pollutants, noting that people like to ask about endocrine-disrupting compounds or chemicals, and pesticides and hormones. The tests are extremely expensive and they don't have the luxury of doing those tests: the municipality can't afford it and neither can they because the project was done on a tender basis. He said that based on the Singapore experience, where they've done a comprehensive set of tests, the confidence level is high.

Mr Marais stated that on the operations and maintenance side, they have an accredited on-site lab where over 12,410 physical and chemical determinants are measured a year, and inline equipment that measures real-time unit process performance, with emergency shut downs if required. He emphasised that it's the soft issues that make it work, and Beaufort West is a success because of reclamation and because it's a small municipality.

" we enjoy taking schools through the plant: the children are taken from the waste water treatment plant, and you can see in their faces that it's 'yucky and smelly' and, as the water gets cleaner, their faces light up. At the end they are given a bottle of water, and the young kids are very excited when they see that - they take that water home to their parents and tell them, "This is what we are drinking!" He said that they also have an open door policy with the municipality; if anything goes wrong, the municipality is immediately notified. ... " – Pierre Marais

Mr Marais emphasised that they present wherever they get the opportunity and he does it because he personally believes in it.

" reclaimed water should be done everywhere: Beaufort West is a success story from the Western Cape and it can be implemented everywhere else with equal success - it has been done successfully in Namibia for 50 years. I reiterate that transparency with the municipality was key, and I'll add that we distribute water bottles wherever we can: the more we can expose people to it, the more we can show people that it can work, that it is a success, and that implementation has been successfully done.... " – Pierre Marais

Session 2: Technical Cape Café

Delegates were divided into small breakaway groups, each with a mix of creative, technical, communications, private sector, civil society and government representation. They were grouped according to municipality/municipal district.

Selecting and refining these ideas for your municipality

Delegates were asked to consider the following questions:

- What are the good and challenging/potentially problematic aspects of these ideas?
- How might we fix the challenging aspects? For example, should we be amending and updating bylaws?
- How can these project ideas be presented in a way that makes it real for the audience in your municipality?
- How can these ideas work best through a programme or portfolio of projects towards provincial water security?

Amendment of section 78 of Act 32 of 2000(b) by the addition of the following subsection: "(6) The national government or relevant provincial government may, in accordance with an agreement, assist municipalities in carrying out a feasibility study referred to in subsection (3)(c), or in preparing service delivery agreements".

- Should we be using the power of the council to enable the private sector to invest more and fund feasibility studies as part of their interventions (i.e. creating an enabling

environment for the private sector to invest in reuse across the board - residential, commercial and city or town-wide scale)?

- How should we be funding these feasibility studies as assistance for water reuse?

Checking idea feasibility

Delegates were asked to consider the following questions:

- Will this work in your municipality/municipal region?
- Which one would you prefer and why?
- Will it interest the superior municipal audience?
- What assistance would you require to support these project idea(s)?
- Can these ideas be promoted through specific communication channels in your municipality?

2.1 Theewaterskloof and Swartland Municipalities Report

How should we be funding these feasibility studies as assistance for water reuse?

Theewaterskloof and Swartland were in the same group. It was reported that when selecting an idea, the challenge is always funding and feasibility; the first and foremost challenge for implementing or choosing an idea. Municipalities might want to involve private developers and ask them to bear the burden of the cost, or a portion of the cost, or to develop the infrastructure. They can also apply for funding from national and provincial departments.

How can these project ideas be presented in a way that makes it real for the audience in your municipality?

It is important to provide researched facts to involve private partners, and to provide politicians with information on how their communities will benefit from the projects. It is helpful to look at examples of already successfully implemented projects, and it helps to persuade people to adopt a particular idea. For example, Beaufort West is a great project to look at for implementation, as is Windhoek, although they are far.

How can these ideas work best through a programme or portfolio of projects towards provincial water security?

Communication with the Department of Water Affairs is essential, and it was suggested that they start a unit in the Western Cape that focuses on water scarcity: it should involve people who are dedicated to addressing the problems and who can monitor the situation for municipalities to address the issues at hand.

How should we be funding these feasibility studies as assistance for water reuse?

Will such a project work? Theewaterskloof and Swartland had different responses.

Swartland already has a membrane treatment facility that treats waste water to a very high quality, which is a good beginning. However, there are two problems: between 80–90% of the effluent from the treatment works is currently used for the irrigation of sports fields and golf courses. Not all the effluent can be used, but it will not meet the consumption need that is currently prevalent in Malmesbury, and the need will expand as the town grows.

Theewaterskloof started introducing new systems at high cost for a small municipality, and needs to carefully consider the benefits of such a system and maybe start by addressing critical areas where needs are the highest.

Will it interest the superior municipal audience?

Swartland needs to ensure that management and the general public are aware of the water shortages. This would mean that it will not be a great task to persuade people that they need an alternative source, especially if communities believe that you can change waste water to a drinking standard. The obstacles might be feasibility, capital and operational costs. Theewaterskloof reported that their people and senior management would only be swayed by proper studies and the costing of such a technology.

What assistance would you require to support these project idea(s)?

They would need technical assistance, the capacity for technical design and project management, and financial assistance because the municipalities' only income is ratepayers and these project are very costly. They might also need initial operational assistance to employ their own people and get them to a level where they can run a water treatment works.

Can these ideas be promoted through specific communication channels in your municipality?

Specific communication channels are already in place. They have senior management meetings, and municipal managers meet with council regularly. They have strategic council sessions, like the IDP sessions, and have by-laws that are reviewed and regularly amended. These are the processes used as communication channels.

2.2 Stellenbosch Municipality Report

What are the good and challenging/potentially problematic aspects of these ideas? The first key point is that water use and reuse must be goal or outcome focused, and it requires a project driver or it will not work. Cost and pricing are critical aspects of the resource: reuse will only occur if it is feasible. So, on the one hand, the costing of the source and, on the other hand, the pricing of it to recoup your costs, is going to be difficult.

How might we fix the challenging aspects?

The regulatory environment must facilitate reuse by removing the obstacles to reuse while imposing obligations through licensing and authorisations. The storm water systems should also be considered for reuse: currently, storm water is let off and it is only the quantity and the level of disposal that's being managed, instead of also the quality of it. That could become quite an important part of the cycle.

Another issue is the base quality of effluent that is being released from both storm water and waste water treatment. When it's going to go for irrigation, there is one set of rules attached to it. If it goes for potable use, there is another set of rules attached.

A representative from agriculture indicated to the group that one shouldn't forget that if you reuse the water in agriculture, there will be an impact. The crops in the Western Cape have a 20-25 year lifespan, so whatever is done to that, whether it's the quantity of water release or the quality, you are going to have a very long-term effect. As it's a primary activity in the economy, the effect is going to be significant, so one should be very careful about what is released for agriculture purposes.

Should we be using the power of the council to enable private sector investment?/How should we be funding these feasibility studies as assistance for water reuse?

Working towards the solutions: It was suggested that the smaller, scalable projects linked to a system would probably be the most achievable. The small scale projects also refer to onsite, development-driven or business-driven recycling/reuse facilities. Government should be the change leader by setting the right example, because the public sector is perhaps not doing what it's supposed to be doing. Social issues are critical and they need to be considered, and in this respect we must remember the three D's: to decentralise the decision-making, to diversify activities, and to run demonstration projects. These three would probably be the solutions.

Will this work in your municipality/municipal region?/Which one would you prefer and why?

Begin with small, scalable actions that are system-based: all along the system there are potential projects and they should be tackled individually, rather than as one big unfeasible and very costly project.

What assistance would you require to support these project idea(s)?

- Invest in reuse capacity, which requires an informed government. The investment is in both knowledge and capital; unless the decision-maker has the knowledge, then you are not going to get the capital.
- Incentives through pricing on both sides; for the input and the output, it's going to be essential.
- Determine an objective and work towards it. Unless there is a very clear objective, it's unlikely to work.

2.3 George and Witzenberg Municipalities Report

What are the good and challenging/potentially problematic aspects of these ideas?

The discussion on water security is not only about resources or the climate; it also includes underpaying for water in South Africa. Water security for resilience or resilience-enabled water security should also be considered. Challenges municipalities are faced with are disaster management, alignment, and appropriate communication.

How might we fix the challenging aspects?

George Municipality's solution to the above is in place. For example, when water levels drop below 60%, the municipality automatically implements water restrictions. There is no need to return to council for approval every time the water level drops. Rainwater harvesting is compulsory for all new developments. Compulsory means there are no

arguments during the “good days” when the drought is less real to the public. The success in this is public level communication, liaising and buy-in, as well as cooperative participation.

Should we be using the power of the council to enable private sector investment?/How should we be funding these feasibility studies as assistance for water reuse?

What could the province or other municipalities have done to support George during the drought (referring to 2009)? Controlled burns during dry periods in catchment areas to improve catchment runoff once the drought was over; budgets, long-term planning and safety nets could be put in place; and assistance in terms of the Disaster Management Act.

All municipalities should enable the necessary corrective actions to secure the water supply, which gives both levels of government power. However, it seems to be under-utilised, and could be used more appropriately and pro-actively. It is necessary for the council to put systems and actions in place, and provide an opportunity to bring into effect appropriate bylaw system/s relying on long-term weather predictions.

Smaller municipalities: Long-term projections are challenging. Province can play an appropriate role to ‘warn’ the municipality, for example, the small municipalities with a lack of technical expertise.

Will this work in your municipality/municipal region?/Which one would you prefer and why?

Reuse by-law: The costs matter if the dam level is 90% - it is too expensive to run the reuse plant. Applying context-responsive financial management is imperative. Water is a catalyst that creates economic opportunities, for example, prompting the private sector to respond innovatively. We need to reiterate pro-active planning to prevent water crises, and moratoriums on development are not ideal.

The challenge is in implementing higher water prices: need to convey the need to politicians and show how to break even. In the George Municipality (among others), there were political arguments over losing income from water awareness campaigns. It is important to obtain pricing according to by-laws and link this to provincial strategy. It is a challenge but also an opportunity: resilience-enabled economy, uptake in IDP.

What assistance would you require to support these project idea(s)?

Province can play a role. The new urban influx creates a focus on structured water works to increase capacity over time. The George Municipality growth scenarios include the development of various resources over time (diversified): reuse, dam wall increase, and 10–15 years with current urban growth at 4.5% also impacts municipal capacity. We must consider the Terms of Reference: What are the technical requirements for a municipality?

2.4 Bitou Municipality Report

Bitou is a small municipality of 60 000 people, and the population doubles or triples in two to three months during the tourism season when they need extra water.

What are the good and challenging/potentially problematic aspects of these ideas? The biggest challenge is environmental. The short-term response is to augment estuaries with additional ground water by 2018. The medium-term goal is an additional dam (3milm³). The dam is currently under investigation, and the proposed time frame is 2021.

How might we fix the challenging aspects?

The group explored reusing water from existing supplies and this came down to feasibility. They also looked at an existing small desalination plant that was built during a drought, treating about 2 mega litres per day, while the maximum water demand is 18 mega litres. They further explored the opportunities beyond the existing use of water on golf estates and school facilities.

Opportunities: Planning is already in place for ground water and a dam in Plettenberg Bay. Kurland and Betty's Bay are both small towns but growing fast. There is a possibility that water can be reused in Kurland for irrigation purposes. It is an area surrounded by farmers who are extracting from the river and have their own farm supplies. They might need to discuss if this option is feasible for them, which might be primarily driven by cost.

The seasonal fluctuation can be solved with a *Waste Water Treatment Works (WWTW) to increase water capacity*. A question that needs further exploration is whether water reuse is feasible for farmers' irrigation. Currently, a golf course and school are exclusively using treated effluent for irrigation.

How can these project ideas be presented in a way that makes it real for the audience in your municipality?

Bitou is looking at a PPP model for the current dam development because it is beyond their existing finances, and they are working with Treasury on that. Selling reused water is also possible but is potentially too expensive. It was suggested that reused water can also be used to recharge *aquifers*.

How can these ideas work best through a program or portfolio of projects towards provincial water security?

All Waste Water Treatment Works are already looking at reuse, and water demand management is currently effectively maintained.

Checking idea feasibility

Feasibility studies must be included in planning and are also needed for irrigation purposes. Costing: It was suggested that farmers pay a set amount for water services. We need to establish how much more is needed to increase WWTW discharge quality from green drop to non-potable, and potable-related to desalination. These costs are not isolated investments and should be financially feasible – perhaps through collaboration such as PPPs (with Treasury suggested for investigation).

2.5 Drakenstein Municipality Report

Lioness Consulting Engineers were appointed in 2016 by the Drakenstein Municipality to look into the feasibility of reuse within the municipality. About 6 years ago, Drakenstein identified possible reuse of effluent water. At that stage, they were already doing some water conservation and water demand management, and doing very well, bringing their unaccountable water down to 40%. Drakenstein currently gets about 90% of their water from the City of Cape Town, so there is a large need for them to look at their own water sources. They went on a large capital outlay and bought the new Meulwater Water Treatment Works on Paarl Mountain. They are also looking at other sources, hence the feasibility study.

What are the good and challenging/potentially problematic aspects of these ideas?

The biggest challenge identified was public awareness. They found that people will only be open to the reuse of water if there are no other sources available. They have already explored and exhausted mud dams, found they could not draw borehole water, nor could they draw surface water. Drakenstein has a good source of water in the Berg River, but the water quality is not up to standard. Drakenstein is already doing some reuse: treating water that had some effluent coming from upstream.

How can these project ideas be presented in a way that makes it real for the audience in your municipality?

One of the other factors is the 'yuck factor' and they want to get past that. Fortunately, they already have a vehicle to speak to the public: Water Week, which is a week of awareness about water issues in Drakenstein. It is working well. It was suggested that other municipalities go a similar route.

It was thought that there is not enough research done on the build-up of micro-pollutants, and this will not be overcome quickly. However, there is currently enough research that there will be an answer in a couple of years.

How should we be funding these feasibility studies as assistance for water reuse?

It was reported that, in terms of the finances, Drakenstein is fortunately one of the bigger municipalities so they do get funding and also have their own finance base. However, the biggest challenge is that the financial model comes down to the cost of water: the capital and financial cost. There is a large cross-subsidisation that happens within the municipalities where water cross-subsidises electricity or electricity cross-subsidises water. That has to be taken into account when feasibility is done, including the cost of testing.

One of the members reported that the cost for testing micro pollutants was exorbitantly high and they would not do it. He then asked about the cost of his life: this is definitely a challenge. However, he also advised that technology will advance and that the tests will become cheaper. He added that South Africa is fortunate to have examples to study in Windhoek and other places, where they are continuously testing and doing research.

It was reported in terms of the financing model that the private sector can play a big role, similar to the service agreement levels played by private producers for Eskom. It was believed that government and the municipalities still have their roles to ensure that there is

a feasible project before they go to the private sector. Operations are also a challenge because municipalities already have skills shortages in terms of their process controllers.

What assistance would you require to support these project idea(s)?

It was advised that the Beaufort West and Windhoek models are the ones to emulate for the future, and that skills transfer might take ten years before operations can be taken over by municipalities.

Other foreseeable challenges are water use licence legislation: not necessarily by-laws, but water license legislation that is part of the greater water scheme as some water will have to get discharged to maintain water balance. Paarl already has a license that states 75% of the water treated must be discharged. He suggested that all municipalities and government departments will have to collaborate to determine the actual needs and what can be reused in terms of the water use license legislation. It was suggested that the Department of Water Affairs be the main partner, together with catchment management agencies to relieve some of the pressure on Water Affairs.

Lioness Consulting Engineers, as the private sector, wants to use their feasibility study to see how they can reuse water, not necessarily for direct potable use, but maybe for irrigation. The private sector examples that re-treat or pre-treat their own water are Chevron and the breweries. It was further advised that irrigation is a 'low hanging fruit' in the Drakenstein, and that irrigation for sports fields is the biggest win for a municipality.

2.6 Question and Answer (Q&A) Session

There were no questions. Ms Shippey commented that the suggestions from the reports were things within municipalities' power to change. She said the question on large scale intervention from Water Affairs and Sanitation is an interesting one because it has not come up within other groups.

She found the by-laws to be an enabling measure because it ensures that municipalities use the same restrictions across the board. She also reported that disaster management teams have informed them that, though there are five declared drought areas nationally, and most are agricultural droughts, some of them have no restrictions on domestic use because they do not have the by-laws in place to put restrictions into effect. This is something that can be easily avoided.

She advised to be aware of the language that is used in relation to water restriction levels; it is not common across municipalities.

She also raised the necessity of being aware of water costing, and the need to use the Water Act and colleagues at Water and Sanitation. As with electricity, private partners have not opened because municipalities charge too little for water, electricity and waste. They never charge what it costs. Therefore, doing accounting in a different way might help to link all the levels of costing so that people can see the real costs, which will open up

private partners. Lastly, many reported reuse as the last option and that is precisely why this discussion is taking place.

Session 3: Overcoming Global Water Reuse Barriers: The Namibian Windhoek Experience

3.1 Keynote Address: Resource Decoupling and the Sustainability Transition: The Case of Water

Prof. Mark Swilling

*Academic Director: Sustainability Institute
Head of Division: Sustainable Development Planning and Management
School of Public Management and Planning
University of Stellenbosch*

Professor Mark Swilling opened his address by referring to numerous publications that address the sustainability and improvement of a green economy, with the focus on 'how do we do a lot more with a lot less?' He also highlighted the 2007 inception of the UNEP International Resource Panel, which decoupled the focus from the environment. It looked at impacts on resource use and inputs into the economy. He said that the focus must be on the transition to sustainability and the impact of socio-metabolic cycles, citing the example of the Industrial Revolution. He said that it is viable to imagine another transition to the sustainable era, and to the use of renewable energy.

Professor Swilling spoke about options for decoupling economic growth from water use and water pollution, highlighting extracts from the report of the Water Working Group of the International Resource Panel. It focused on the increase in demand (projected range from 2005 – 2030). The report noted that dead zones (water stressed zones) are increasing, as is leakage in urban water supply networks. Decoupling is most evident here, and the water use to GDP ratio is on the decline in many countries due to water pollution.

" Solutions:

- **Reduce non-revenue water.**
- **Implement radical water efficiency measures, particularly in agriculture.**
- **Reconfigure urban water and sanitation systems.**
- **Use closed loop water management.**
- **Consider decentralisation, with a focus on partnerships coordinated by government..... "** – Prof. Mark Swilling

Turning to problems in the catchment, Professor Swilling pointed out the factors that impact the economy:

- Water quality and quantity (Breede);
- Small farmer development programmes requiring high water demand;
- Adherence to environmental and water laws;
- Export of fruit and detection of pollution;
- Increased electricity usage due to water pumping;
- Lack of system perspective by policy makers; and
- Research being a band-aid for old problems.

Expected solutions:

- Job creation;
- Lower electricity usage;
- Enhanced rural livelihoods: more small farmers decrease the environmental footprint and improve the water quality and quantity;
- Clear guidelines for farmers to operate within legislation;
- Improved control over river health and better water metering.

The following water distribution schemes already comply: Teewater, Franschoek, Jonkershoek and Blydepoort (which is 95% effective). The rivers that are non-compliant are the Breede, Berg and Oliphant.

Professor Swilling spoke about the WRC 'Taking Stock of Water in the Breede River' report, and explained that the report led to the proposal to link all dams in the system into one interconnected grid, with dams brought to a unified water level (such as the Teewaterkloof, Franschoek and Eerste River system). The dam outlets would be linked to the grid, which should allow direct flows to the river and also compensate upstream dams, creating a buffer against climate change (resilience).

The following advantages were listed:

- Better and more water supplied under pressure;
- Lower need to pump water;
- Improved buffer against climate change;
- Smallholders will receive pressurised water, improved quality and more affordable produce;
- Improved ecological aspects and ecosystem services.

" collaboration is key with respect to innovation, particularly in terms of integration with the public sector being a pre-condition. Economic development partnerships (and other stakeholders) lead to coherent engagement. The innovative framework of decoupling should be used to think about and allow for the drawing in of multiple stakeholders as a necessity " – Prof. Mark Swilling

Discussion

- **The dam system energy battery sounds like a grand scheme at the centre with maintenance for decoupled water. Africa's more a red hot dry opportunity for more water via the energy route?**

Professor Swilling responded that there is more danger in the grand scheme being the only focus. He said the group was looking at the Breede River from a more technical thought and learning process towards reform, and moving away from the over-supply of water into the agricultural sector. The money farmers spend for this excessive supply is nonsensical, thus bankrupting itself. We should rather spend money on an alternate system. Rand Merchant Bank (RMB) funded a system on the Breede River, but it depends on collaboration. He added that we must redirect to look at alternatives. Decoupling water from water is beneficial when applying a system approach, and experiments link it to renewable energy in other parts of the world.

- **Is it innovation or an experiment of renewable energy concepts which makes it cheaper? Renewable energy is driven with the government identifying risks at inception of the innovation cycle. The state normally withdraws when the market takes over.**

Professor Swilling said that you cannot be innovative if you are fearful of failing - it's a precondition for success. He said that we need a mature way to figure out how to move forward: get the partnership right, and obtain the required support i.e. IDP's capacity to partner across boundaries, etc.

" we can form partnerships with universities to harness academics and engage in problem-solving – government should factor a constructive role for the universities.... "
– Prof. Mark Swilling

- **Comments:**

Breede River collaboration: cooperation is needed to find solutions that take stock of the Berg River. We need to find solutions incorporating stakeholder feedback, landowner's involvement and build partnerships. We should apply a systematic approach in working together and talking, including in other spheres i.e. technology. We must review successes and build on it.

Kwa-Zulu Natal University has a contract with Professor Buckley, making money available to solve water problems. They are solving numerous issues due to this partnership: it should be well managed as an academic institution that will produce results. Linking dams in reality: we have fairly integrated systems i.e. Lesotho into

Gauteng, also the Orange River system into Nelson Mandela Bay Municipality. It helps us to caution reality through evolution processes.

With reference to provincial treasury training team and global public schools partnerships, we need to know the needs, to literally focus on what we have done wrong, i.e. the Chapmans Peak, Gautrain initiatives - both from a technical and business perspective. We risk responsibility and the profit sharing focus of the market approach with real costing form part of discussion with politicians - If you don't, you will be taken for a ride.

3.2 Water Quality and Information Management: The Windhoek Reuse Experience

Mr Jürgen Menge

Practitioner: Innovation Research for Water Solutions

Windhoek, Namibia

Mr Jürgen Menge began by giving an overview of the global history of reclamation listings ranging from 1962 to date. He then said that South Africa's research on the Goreangab Dam facility upgrades was a key factor in Windhoek's potable implementation, which in 2018 will have been in use for 50 years. He highlighted the prerequisites for reclamation: the separation of domestic and industrial effluents, the importance of effective biological treatment, relevant treatment barriers, and testing guidelines for verifying the quality of water and results. He said that a partial safety barrier would remove between 40–60% of a constituent, and a complete barrier would remove more than 99.9%.

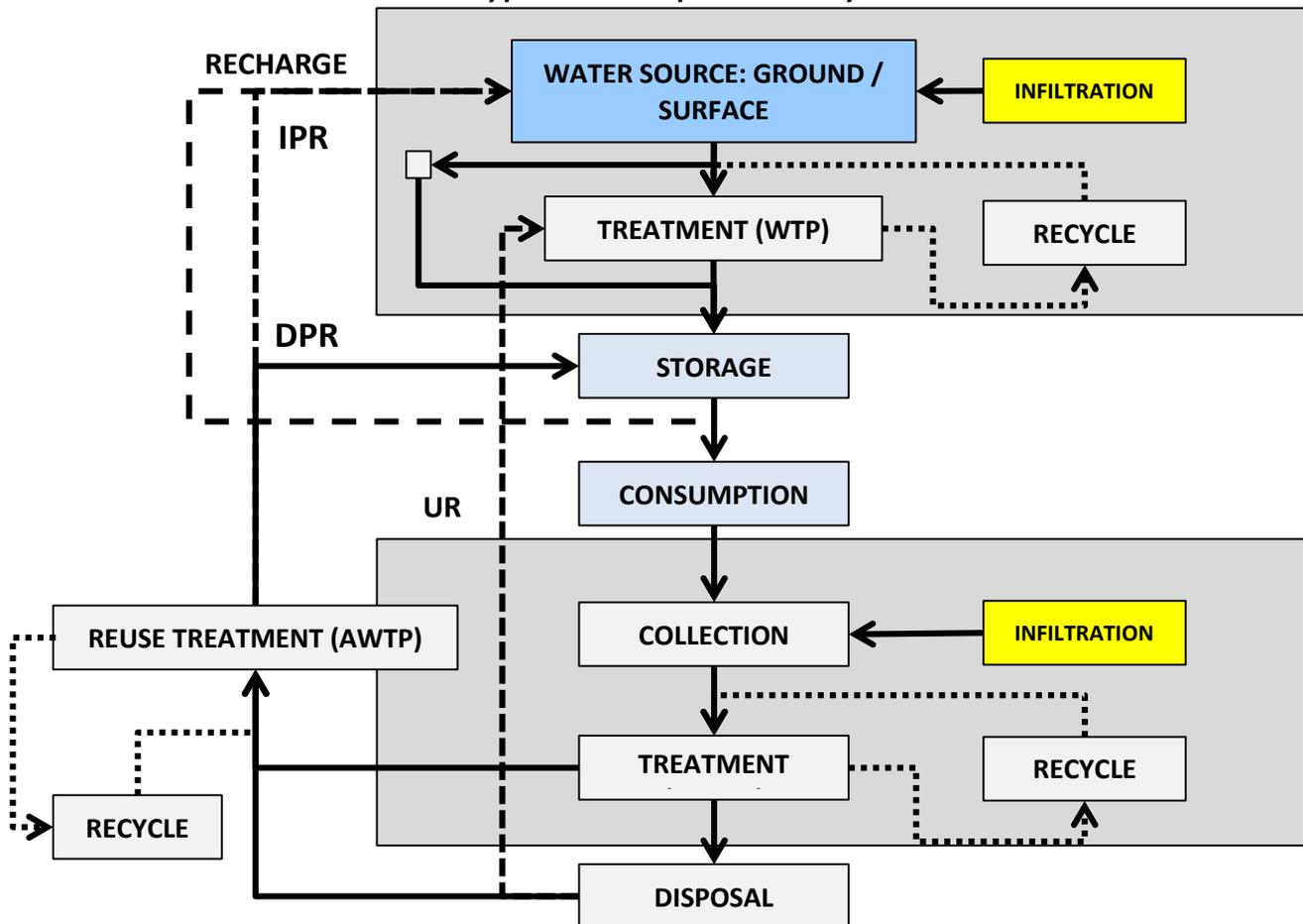
Mr Menge explained that monitoring processes are vital: it limits pollution infiltration and ensures conformity to relevant international and national acts, standards and guidelines to address environmental and health risk factors. He added that stakeholder involvement, and acknowledging their responsibility, is crucial to the consumer and operations in providing safe water. He explained that drinking water is essential and communication is key, adding that when we operate in isolation it affects the water. It is in the public interest that the water supplied by the utility conforms to required water quality targets.

Mr Menge went into more detail about the regular monitoring of the raw water source, the treatment process steps themselves, and the final water produced. He said that it is the only evidence that the utility or institution can produce to reassure consumers that the plant has indeed met all the required targets.

Mr Menge said that operational monitoring requires knowing the plant, and is key in saving costs. It also ensures the safety and compliance of final water. In correlating data, it aids in rectifying raw water events and results in best practices that impact the operational cost of water protection treatment units and processes, final water sampling, analysis and distribution.

Mr Menge explained that the history of Windhoek's water supply indicates that for more than 45 years (1968 – 2013), Windhoek was the only place practicing direct potable reclamation. This was a necessity due to severe water shortages.

Typical Municipal Water Cycle:



Risk in primary and secondary catchment

Mr Menge said that Windhoek has complex networks, with five sources into the system that affect quality. He noted that there is increasing evidence of the risk of water-borne diseases and their public health impact, as well as the shortcomings of commonly used indicators. This justifies supplementary tests on the quality of raw and treated water, and the efficiency of treated systems, wherever possible. It would seem logical for the water industry and the health authorities to calculate expenditure on water quality monitoring as a percentage of the total budget for water supply, duly taking into account the potential price of disease and consumer perception of efforts to ensure the safety of water supplies.

Mr Menge spoke about the improvement of technology in new plant and operations in the laboratory. He expanded by saying that capacity building, the training of staff, experience and exposure to overseas cases (such as Singapore) are factors that enhance the quality of the water.

" challenges are dealt with according to the incident procedures and according to risk ranking. Communication is imperative, and effective reporting to stakeholders lowers the risk, creating easy investment. To gain trust, there must be professionalism and care on the side of the utility during engagement with the public. The trust gained will reassure the public and the critics that you are able to handle a critical situation..... " – Jürgen Menge

Mr Menge described the channels that enhance communication with water users and the public:

- Steering committee (local and overseas experts, trusted public representatives);
- Government support from the local authority;
- The media;
- Public lectures (including scientific societies);
- Visitations/tours (local, overseas, students, foreign embassies, politicians);
- Research and attachment programmes for local and overseas students;
- Public surveys by overseas and local students;
- Free of charge complaint investigations.

" In light of the above, the opportunity for the private sector and municipal steering committee is to educate. This team must be put together before the project starts and should monitor the process for a minimum of one year after commissioning. A budget is vital to succeed and is required for ongoing support to continue testing and applying new methods to enhance growth..... " – Jürgen Menge

Mr Menge noted that new guidelines are imperative, and added that constant monitoring is essential. The involvement of top management and key politicians keeps projects going and enhances additional testing. He also stated that specialists are used for credibility. It is important to validate processes prior to online publishing, with a range of validation and verification thereafter.

In concluding, Mr Menge reiterated that direct potable reclamation produces drinking water of a high quality, and is a practical and economical alternative in arid regions to augment the potable water supply. He said that it has contributed to a stable local economy during severe droughts and water shortages, which requires continuous monitoring and research to improve systems influenced by changes in the catchment. New guidelines and standards are released with ongoing commitment on all levels, political will, comprehensive planning and training for continued success.

End of day 1: Mr Mukanya thanked all the presenters and participants, and closed the proceedings for the day.

DAY TWO: Tuesday, 21 February 2017

Opening Session: The Real Cost of Water Scarcity, the Impacts and Ecological Design Solutions

Programme Director: Mr Ronald Mukanya

Director: Sustainability

*Department of Environmental Affairs and Development Planning
Western Cape Government*

4.1 The Real Cost of Mismanaging Water: Its Impact on Agricultural Production and the Provincial Economy

Mr Ronald Mukanya

Director: Sustainability

*Department of Environmental Affairs and Development Planning
Western Cape Government*

Mr Mukanya's session offered practical insights into the real cost of mismanaging water, such as its impact on agricultural production and the provincial economy. He first played an innovation video of a Samsung developed technology in Latin America which could have changed people's lives, which instead is saving people's lives as an illustration of well geared up the private sector is in solving today's problems to the benefit of all. He then played another video titled 'Place of Sweet Waters', which focused on saving water. The film was produced as part of the global sH2Orts film competition run by international development charity WaterAid and the Public Media Alliance's WorldView project, with the aim of documenting the future of water. 'Place of Sweet Waters' documents Cape Town's bountiful fresh water springs, which run out of sight under the city centre and directly into the sea - being 'wasted' according to campaigner Caron Von Zeil, who features in the film. Mr Mukanya encouraged delegates to connect more with our water sources going to waste. Every drop added together is significant in importance and contributes towards volume.

4.2 Water Scarcity and the Impacts for Local Government Planning

Dr Kirsty Carden

*Urban Water Management Research Unit/Future Water Institute
University of Cape Town*

Dr Carden described 'Future Water', a new research institute that spans across the University of Cape Town. It is a collaborative effort between all departments at UCT, because every department does some sort of water research. Future Water was launched in September 2016, and it focuses specifically on water scarcity.

Dr Carden's session focused on urban water management, with a broader future outlook on water. She showed a video by Professor Tony Wong, who is the Chief Executive Officer of the Cooperative Research Centre for Water Sensitive Cities at Monash University in Melbourne, Australia. They are world leaders in water sensitive city designs. Dr Carden suggested a water sensitive design for South Africa to counteract the effects of water scarcity, highlighting Professor Wong's assertion that the way we manage urban water influences almost every aspect of our urban environment and quality of life.

" many issues affect the demand for water, including increasing urbanisation and an increase in the demand for water. The quality of life is improving and by 2030, over 70% of the population will be urbanised..... " – Dr Carden

" South Africa's water crisis is "too much, too little, too dirty": it goes from flooding to droughts to continual low water quality. There are many reasons for this, including low rainfall, high evaporation, poor water quality, leakage and wastage, population growth, urbanisation, limited investment or investments directed at the wrong things, and fragmented governance with no interaction..... " – Dr Carden

Dr Carden referred to the latest 'Parched Prospects' report by the Institute for Security Studies, which states that South Africa is overexploiting its water resources at the national level. Water withdrawals for municipal, industrial and agricultural sectors will increase over the next 20 years, exceeding sustainable levels of supply. The proposed interventions for increasing supply and reducing demand are not enough to reconcile the gap, and more must be done to bring the South African water sector into balance and reconcile future national water withdrawals with future national supply. South Africa has to think about alternative ways to meet the water demand.

Dr Carden complimented the City of Cape Town's water dashboards, which give ongoing information about water levels. She warned that the Western Cape should be better prepared for more dry seasons. She mentioned desalination and the high costs to run it, which would translate into very expensive water. This again raised the necessity to find alternative sources. Dr Carden said that she was encouraged by signs of new technologies that can provide a cheaper solution. She added that researchers want to see desalination as a last resort.

Dr Carden then spoke about Professor Wong's 'Future proofing' cities, which focus on the following features:

- Resilient (coping capacity), liveable (comfort capacity), and sustainable (carrying capacity) cities;
- Blue/green corridors as integral elements of a city's drainage infrastructure for flood conveyance;
- Influence of socio-technical dynamics;
- Managing storm water as a resource;
- Enhancing the water-energy-waste nexus and recovery of resources;

- The need for multi-functional infrastructure - hybrid between centralised and decentralised water supplies and waste water treatment to meet basic needs and enhance aspirational needs - producing infrastructure that beautifies the city.

Dr Carden reported that two to three times the amount of rain falls on the Cape Town catchment area is the amount of water that is used. She suggested that this water should be captured and used in some way, in order to be less dependent on bringing water from outside.

Dr Carden also referenced Professor Wong's TED talk on envisioning water sensitive towns and cities, and how cities can be more resilient. Water Sensitive Urban Design (WSUD), which is called different names in different countries, integrates water cycle management with the built environment through planning and urban design, providing multiple benefits and opportunities to overcome challenges with water management.

Dr Carden asked how South Africa can implement Water Sensitive Urban Design. She noted that it is a holistic approach: the idea is to create a critical mass of knowledge and an integration of the planning activities required to adopt water sensitive design. She added that WSUD helps with better urban water management, and provides the core for multi-value multifunctional urban spaces that are fit to cope with future challenges. The key to resilience is water diversity. Implementing this strategy includes leak detection, tariffs, water efficient devices, water restrictions, awareness campaigns and behaviour change.

On the topic of waste water reuse, Dr Carden said that treated sewage effluent can be used for schools, sports clubs, golf courses, farms, industry and commercial developments.

Turning to the Draft National Sanitation Policy (2016), Dr Carden said that the DWS are now trying to build this concept into the new sanitation policy. She noted that there is a need to unpack the policy statements on grey water so that grey water systems can be used in homes in the future. She added that the risks of using grey water must be quantified, i.e. being cognisant of what is in the source and the purposes for using it, as well as being aware of the risks. She said it has relatively limited quantities, can contain a high bacteriological load, and that the treatment costs are generally high. However, it is already extensively used in water-scarce areas for gardening and toilet flushing.

Dr Carden then spoke about storm water harvesting, characterising it as “important but polluted”. She listed some of the benefits of storm water harvesting (SWH):

- Improves water security and is an alternative source of water;
- Reduces flooding;
- Stores and removes ‘surplus’ storm water;

- Provides additional benefits: e.g. amenity, 'value capture' by adjacent real estate, preservation of biodiversity, reduction of the 'heat-island' effect, provides 'sense of place', etc.

Dr Carden highlighted the Singapore experience, noting that Singapore was dependent on water from Malaysia and wants to be water-independent by 2060. All catchments are clean, have bio filters, and are used for urban agriculture. Water education is very effective and very clearly demonstrated throughout the city.

Dr Carden then focused on the key challenges for South Africa, particularly in terms of equity relating to dignity, ownership and respect. She said that talking about the greening of cities is ludicrous when basic services do not exist. She underscored the importance of giving people basic skills at all levels, and creating systems that can be readily adapted for the future.

Dr Carden explained that Water Sensitive Urban Design (WSUD) focuses on a paradigm shift, and the need to think about all forms of water along the water cycle as a *resource*. It is gaining recognition in South Africa as a tool that could help to address the challenges of providing adequate water for social, environmental and economic purposes. WSUD brings together a range of considerations under one umbrella. There are two main principles – infrastructure (sometimes referred to as green infrastructure), and design and planning. WSUD also relates to protecting the natural environment and the public from the impacts of urban development. Legislation and by-laws are critical in helping people to think of development in a different way, and for the public to be sensitive to this in order to help the city. Dr Carden suggested that South Africa needed to build on this concept.

Dr Carden emphasised that the key question of WSUD was whether we can use water in a more 'fit for purpose' manner. Can we recover more resources, energy, and nutrients, and how much more sustainably can we manage our water?

She concluded by showing a video on 'The Water Hub', and reiterated that South Africa must start thinking about cities and water in a different way. This would entail researching how to build in terms of treating water in low income settlements (and not only within cities), and how to use the natural spaces within the urban environment in a better way.

4.3 Discussion

- **Comment:** Peter Lombard (Director: Planning Economic Development, Stellenbosch) commented that part of the success of The Water Hub will depend on the reduction of litter and waste from the community because plastic and other things go into the storm water systems. They are working on a project: contracted trucks can't work in these communities, so they rolled out wheely bins to communities and linked them to other

Expanded Public Works Programme (EPWP) initiatives where people are paid to ensure the waste is collected. The bins are placed along routes where the trucks can work. The project is only two weeks old and no impact can be reported yet.

- **Comment:** Mr Jürgen Menge commented that one needs buy-in in some projects to change behaviour patterns.
- **Question and comment:** An economist working in environmental planning asked about The Water Hub, a well-kept secret, and asked how inclusive the design was in terms of the local community, because service providers/researchers tend to come with innovation and expect communities to accept it. He finds that it is normally highly exclusive. He stressed that we need business, government and society to work together because we tend to think one of two represent sufficient collaboration. Despite access to highly knowledgeable people at every level, innovation is still exclusive and the world has become a more unequal place as a result of the value system that embeds and continues to entrench a particular type of development. He referred to formally exclusive apartheid planning, and wanted to know if the Western Cape is making planning inclusive around water.

Response: Dr Carden said that she did not feel qualified to address the above questions. She said it might not have been clear in the video, but The Water Hub is situated at the old Franschoek Treatment Works next to a piece of land on the Rickety Bridge. She reported that it is not located within the low income settlement, but the run-off is from a low income area called Langrug and also Groendal, which comes into the Franschoek River. In terms of the design of the project, they had a series of workshops that included community representatives to stake out a vision and inform their process. The project is still at the stage of finalising the vision and developing the necessary partners and capital; business, communities, researchers and government are involved with the project. With respect to the second part of the question, Dr Carden was not sure how water was being taken into account.

- **Comment:** Ms Karen Shippey suggested a 'joining the drops' project because this needs to be taken back to smaller municipalities. CoCT is well resourced and has technically astute people. However, people often struggle in smaller municipalities, especially when they have to convince councillors and get funds. There is therefore a need to educate councillors across the province about these issues. This must include practical guidance on how to fit these issues into Integrated Development Planning (IDP), how to get it formalised, and how to get it funded. They have therefore been talking about guidelines and possible generic by-laws that can be used to draft restrictions, because there is not a common basis across municipalities. This can be adopted and tweaked according to particular municipalities. She mentioned that a SuDS might also be required. This would have to be translated appropriately to meet specific municipality needs and be adopted by Council with by-laws to support them). The importance factor is that the more things are formalised and institutionalised, the less one needs an individual champion who spends twenty years getting it through the system and convincing each set of politicians. This will make a big difference to municipalities.

- **Question:** Peter from the Provincial Department of Agriculture spoke about their food gardens, especially in rural areas, and wanted to raise the issue of grey water reuse and the biological risks of using grey water at household level. As an authority, they support the reuse of water for food gardening, etc. However, how can they position themselves in terms of grey water reuse? He said it is illegal to tap into the grey water system at house water level, and Agriculture wants to distribute pamphlets and give recommendations. He wanted to know how to word that and if they could be legally liable if people get sick.

Response: Dr Carden said that the idea of institutionalising grey water terrifies her because there is no undo button: institutionalising it without knowing the risks is asking for trouble. She said the Water Research Council would like to develop guidelines that say it is extremely difficult to control the risks, particularly in low income areas because in those areas it is more like black water. However, in times of drought, people use it whether there are guidelines or not, and they will continue to use it. She suggested being pragmatic because there are certain uses for which it is safer, like toilet flushing and irrigation of gardens, though it needs to be clearly stated that vegetables irrigated with grey water cannot be eaten raw or need to be cooked. She said that it is not yet clear what is in grey water, and what the outcome of institutionalising it on a large scale will be. She suggested caution and said it is better for use in institutions and commercial buildings where it can go through a treatment system and be pushed into a reticulation system for flushing toilets.

- **Comment:** A delegate from Environmental Affairs commented that from an institutional view, there is a policy to guide open spaces and wetlands. The policy should guide everyone and every discipline within that municipality, and should not be ignored (as is sometimes the case). The delegate suggested that this is an aspect that needs to be worked on.

From a systems approach, he reported pockets where WSD is applied, and said the question should be how it can be connected to make a greater impact. He mentioned the Dorp Street roof garden as an example, explaining that it was envisioned as part of urban planning in 2005 to have one on every building but the concept was not used. He suggested the need for a systems approach in connecting the dots for a bigger impact. In other words, where policies exist they can be improved, but they must be implemented, especially by those who initiated the policies.

- **Question:** On a positive note, Cape Town wants to adopt a WSD approach. How can it be used to make a greater impact?

Response: There is a current water research project underway on linking/using the Spatial Development Framework on land use, which is part of long-term planning.

- **Comment:** Johnny Harris of Isidima Design responded to Karen Shippey's point on capacity building. He reported that the CSIR is involved with updating the Red Book, which is an engineer's and planner's guide for development. He wanted to highlight

that where capacity is limited is that mainstream engineers stick rigidly to guidelines. Therefore, if the guidelines can be updated it will help to create a positive move forward. Secondly, his company has been appointed by the Western Cape Government to review the sustainable water plan, and he appreciates all the comments as it has been a very valuable session for them. He would like to invite everyone to workshops where ideas and plans for moving forward will be discussed. These workshops will take place in the next few months.

- **Comment and question:** Rebecca, an urban and regional planner, questioned (as a resident of the City of Cape Town) their commitment to the planning and implementation of the SuDS policy. For example, in terms of her experience working on green infrastructure, it has to be accounted for differently. Unlike the regular storm water systems with pipes that degrade over time, green infrastructure systems can increase in value over time. Therefore, for the actual implementation and realisation of SuDS, the provincial and national treasuries need to get their minds around the procurement systems and the Municipal Finance Management Act, and to include this to prevent the current blockage in implementation.

She also reported that the CSIR is developing the Green Book, and asked if the Green and Red Books could be integrated. Lastly, she had a question on how municipalities make improvements to spaces (related to value capture and implementing SuDS).

Response: Dr Carden commented on the implementation of SuDS and infrastructure, and the fact that it is not brought into the financing space. She reported that it is often also not brought into the asset space within cities. This is something that they need to think about because whilst it may increase in value, it may also decrease in value because it is not maintained, as often cities do not know how to do this. She suggested that it could be part of a maintenance register regime or schedule. On value capture, Dr Carden said that she would provide the delegate with information used in eThekweni (which she will follow up for the delegate). She reported that, in general, there are not many examples.

- **Comment:** Ms Shippey reported on active work happening in the procurement space: Human Settlements, in terms of greening their procurement, and strategic procurement used by government to leverage social interventions, which includes everything from local content to self-sufficiency discussions. She reported that Treasury and Supply Chain are thinking about this, particularly in the Western Cape. She also mentioned work being done with the UN on sustainable public procurement with provincial treasury.

Ms Shippey then spoke about a study done by the former Technical Advisory Unit of National Treasury into projects that have been undertaken for climate change work across municipalities. The findings of the study were that MFMA allows climate change work if the right rules are followed. The study was done in 2013 and, unfortunately, guidelines have not been set yet. She suggested that they need to get the findings and that CFOs must make it available.

- **Question:** A delegate asked about the drilling of private boreholes within private residences, which their municipality could not control. There was an issue around who owns the ground water resources. Can people just drill as they please? There are also health issue concerns related to whether it is used for domestic or irrigation purposes. She asked for responses from municipalities based on their experiences, or anyone who has done work on this.
- **Response:** Dr Carden reported that it is difficult to regulate and control. In CoCT, it has to be registered but they do not regulate them and usage is left up to the owner. She mentioned that boreholes are exempt from Level 3 restrictions of use for certain purposes, and she felt that even boreholes should be subject to the same restrictions.

Mr Mukanya thanked participants for their comments and questions. He also thanked Dr Carden and handed over a gift. He reported that they invited over 30 municipalities and are gratified by the presence of the smaller municipalities.

4.4 Potable Water from Sewage: Leadership for Overcoming the 'Yuck Factor'

Mr Chris Millson

*Sustainability Consultant
Kesho Africa, Cape Town*

Mr Millson spoke about the 'yuck factor' related to getting potable water from sewage. He asked participants how a video showing sewage going out to sea made them feel. Participants responded that they felt cheated, outraged, angry, disappointed and concerned.

Mr Millson said that when you see these sorts of images, an emotional response is elicited. These emotions are a powerful thing, and can be used for positive gain. For example, you might see an opportunity – a valuable resource being wasted that could instead be taken advantage of. Mr Millson explained that just changing a few words can turn emotion around. He added that for him, personally, it was one of the reasons he decided to do this. The message for him was that reuse is just one of the range of potential interventions we can look at.

" the huge knowledge gap in getting people up to standard with the modern water cycle. Our society is far more advanced now, and while we will have challenges, they don't have to be insurmountable. Our society is ingenious: we can learn what we can and apply what we can to our own projects..... " – Chris Millson

Mr Millson reiterated that the 'yuck factor' is a real thing. He conducted two phases of research: communication, and feedback on how to implement it in the most strategic way. He looked at the City of Cape Town, and spoke to engineers and the private sector, and got some input from leaders and consumers. He then decided to try and test some of those ideas. When he started engaging with groups, he wanted to know how effective the key

messages were. To this end, he needed to add communications experts, such as advertising experts and people working for sustainability companies and NGOs.

The second phase was the online survey. He said that, on occasion, it was good to draw a comparison between the perceptions of those two groups. This process allowed him to test the ideas around the effectiveness of key messages, how effective these ideas are in terms of the implementation of strategic actions, and to test the perceived levels of trust in various stakeholders. This could have huge implications for how to attack this issue.

Is the 'yuck factor' a formidable barrier to direct reuse?

- It can and has been.
- Research is very important.
- Research prerogative to keep water tariffs low.
- Lack of education amongst consumers.
- Lack of public in water utility.

What is the most important message for increasing public acceptance of reuse?

- Government engaging with a close group with regards to their view on water.
- Involving academic leaders.
- Having a public awareness campaign.
- Start awareness campaigns at schools.
- Involve community leaders.

What are the most important actions for increasing public acceptance of reuse?

- Communication is key.
- Getting the public educated to contribute to the positive change.
- Introduce the public to the people who will run the project.
- Launch an awareness campaign for the public to understand the scarcity of water.
- Facilitate discussions within communities and ensure they are aligned with the idea of reclaimed water before going further with the project.

What are the implications for sustainability leadership?

- Building public trust through communication.
- It can cause panic if the public is not properly informed.
- Empowering an informed public.
- Overuse of negative messages may result in denial and apathy.
- Reclaimed water can be purified through positive association.

Mr Millson ran a workshop session. Notes from this session can be found in **Appendix A** at the end of this report.

Session 2: Closing Plenary

5.1 Closing Remarks

Mr Ronald Mukanya

Director: Sustainability Development

Department of Environmental Affairs and Development Planning

Western Cape Government

Mr Mukanya, in response to an earlier question about the regulation and control of boreholes and well points, said that Namibia has regulations in place. Interested parties could speak to Mr Pierre van Rensburg and get the information.

Mr Mukanya then spoke about the department's work with various universities, emphasising the importance of forming partnerships, sharing ideas, and collaborating on solutions. He shared that 'cracking incentives for agriculture' is the department's next assignment, although finding the budget for this may be challenging.

Mr Mukanya thanked Minister Anton Bredell *in absentia* for making time to spend with delegates the day before, particularly as it is not easy around this time of the year with all the things that are happening. He also thanked the Head of Department, Mr Piet van Zyl, who spent the entirety of the previous day with delegates. He added that, from a senior management perspective, such commitment is appreciated.

Mr Mukanya thanked African Kaleidoscope, the people responsible for getting everyone together for the event, and saluted their organised team. Mr Mukanya also expressed his gratitude to the *South African National Biodiversity Institute (SANBI) for the beautiful centrepieces on the tables.*

He thanked the rapporteurs capturing the event, and said that he was looking forward to reading a concise report on the outcomes from the summit. He also thanked Tammy, Kristy and Rosemary, who did some ground work, saying that the event would not have taken place without their efforts.

Mr Mukanya thanked the scientific committee, starting with Mr Pierre van Rensburg and Mr Jürgen Menge. He said that he knows that it is not easy to come from Windhoek and, despite the pressing needs in Namibia, they still took the time to support the department. He then thanked the local partners for their participation and contributions: Professor Mark Swilling, Mr Pierre Marais, Dr Kirsty Carden, and Mr Chris Millson.

Mr Mukanya extended his gratitude to all the municipalities that attended. He mentioned that there were also a number of engineers in attendance, including from Swartland, Theewaterskloof, George, Bitou, Stellenbosch and Drakenstein. He said that he was grateful for the debates amongst the engineers, the private sector partners, and the department, and reiterated that the government is not working alone - they are partners working

together. Lastly, Mr Mukanya thanked the sister departments from the Western Cape Government and everyone present.

Mr Mukanya announced the end of the summit and said that delegates deserved a round of applause in appreciation of their participation. He encouraged delegates to hand in their questionnaires to Alison of African Kaleidoscope in order to get a copy of the summit PowerPoint presentations, and wished delegates safe travels.



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Environmental Affairs &
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Appendix A: Workshop on Dispersed Transformational Leadership

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Mapping of current acceptance levels with the surety that water is safe:

- Taking politicians to places/actual case studies where it has already been done.
- Evidence base that is easy for the ordinary person to understand to build trust in all languages.
- Comparative studies: publish consumption figures in similar cities and compare per capita.
- Take bottled NEWater into selected communities, schools, church groups, taxi ranks, sports clubs, malls, residential areas, etc. and documenting the response.
- New culture – create something linked to this. For example, create hype that can run by itself.
- This should be a continuous process, not just a response to crisis.
- Online/Mobile survey delinked from government and run by a third party, for example, CSO/NGO or university.
- Internet – Survey Monkey and Facebook, etc.
- Demonstrating where this has worked – it's not the first time, it has been done before.
- Use census as a data tool/process.
- Community survey, municipal websites and local soaps/TV channel, radio and YouTube channel tracking social media trending.
- Entity/body marketing the product must use it i.e. municipality uses the water all the time in its own day-to-day activities in meetings and workshops, etc.
- Track bottled water sales - if they increase, are people not accepting the H²O tracking trends?

Real opportunities for dialogue:

- Make IDP the focus – formalise into plans.
- Channel community leaders.
- Value input from different sectors (2-way; community and local development).
- Leverage municipal/ward forums/committees.
- Knowledge sharing (examples).
- Educational programmes (add to current).
- Multi-level groups (portal of information).

- Use crisis.
- Create standards.
- Talk money with business sector.
- Start at NGO level to communicate community needs.
- Internet/smart tech surveys and smart tech apps (information for dialogue).
- Feed into water resource plan.
- Professional help i.e. marketing campaigns.
- Think tanks.
- Listen to conflicting views.

Inter-party co-operation:

- Political buy-in.
- Inter and intra-party conflict and debate.
- Pressure from public opinion.
- Facing a big enough crisis (it's our failure) – the leveller/failure will be shared by all.
- Jargon used - be positive.
- Tap into personal perspective – individual councillors.
- Start with a core group (municipality).
- Also about spheres of government – mandates and alignment.
- Tell the councillors whether they are trusted.
- Technical officials present the facts (lack of trust from councillors).
- Political champion.
- How does this align with party policy?
- What about other stakeholders?
- Take ownership.
- Secret ballot when approving.
- Access to water is a constitutional right.
- Multi-party steering committee informed by technical officials.
- Councillors need to be educated on what their responsibilities and mandates are.
- Over-concern about maintaining political seat.

A clear and robust regulatory framework:

- Sell to mandate holders.
- Political buy-in.
- Clear set of indicators (something to measure).
- Must be practical.

- Consider unintended consequences (do no harm).
- Existing Best Practice – Singapore, Australia.
- Visit plants! Namibia.
- Strong leadership from mandated authority (DWS).
- Enable policy coherence.
- Principled driver, flexible volume (prescriptive).
- Incentivise reward outcomes.
- Finance to implement, maintain and enforce.

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