



## Fluid Thoughts

### South Africa – a global water capital

World Water Day, 22 March 2017, was a special day in South Africa's water history.

This was when eThekweni was the venue for the launch of the 2017 United Nations (UN) World Water Development Report, as well as the announcement of the 2017 Laureate of the Stockholm Water Prize, two major annual water milestones. President Jacob Zuma, in his capacity as a member of the UN Secretary General's Head of State Panel on Water, emphasised the need to join forces around the world in a race against time. That race is the achievement of the Sustainable Development Goals (SDGs) for water and sanitation. Universal access to safe water and improved sanitation by 2030, leaving no-one behind, is perhaps one of our most ambitious multilateral goals to date.

And this is only the beginning. The UNFPA (UN Population Fund) estimates that the global population will exceed 9.7 billion by 2050. This will be an additional 3.1 billion people in urban areas, with the largest population increase being in Africa, given its current youth dominated demographic profile, followed by Asia. This is the next step to the SDGs, the Ten Billion Initiative and

the challenge of water and sanitation access to a highly urbanised 10 billion world in 2050. This is a formidable task that requires strong leadership. In his statement, the Vice-Chair of Un Water, Joakim Harlin, called the South African event the largest event in the UN system on World Water Day 2017. There were many international delegates that also referred to South Africa's global water leadership during the three day summit with some using the term 'global water capital'.

This begs the question. What is a global water capital, and does South Africa meet the criteria to legitimately be called one? We know that in spite of being a very dry country in all our recorded history, in fact, currently the 30<sup>th</sup> driest country on Earth, we have

also maintained a reasonable level of water security over time, including during very harsh drought spells. We have also been successful in developing a water intensive economy through smart storage infrastructure, inter-basin transfer schemes and innovative international arrangements. We have also had our fair share of water, wastewater and sanitation challenges.

So, what would be the characteristics of a global water capital? It has to be a country that leads in the international water dialogues. Here South Africa has a favourable reputation. Apart from being a member of the UNSG's 11 Heads of State Panel on Water (HLPW), water and sanitation minister, Nomvula Mokonyane, has ensured that South Africa has become a leading voice on both on the continent and globally on both water and sanitation matters. South African institutions like the Water Research Commission, our universities and the leading water boards have been prominent in many of the global dialogues, such as the Stockholm International Water Institute's World Water Week, the Singapore International Water Week, the World Water Forum, the International water Association and many others.

The second characteristic would be research and innovation leadership. South Africa does well on the knowledge generation front ranking in the top 20 of the ISI index with respect to publications in the water resources domain. Our innovation record is currently less impressive. South Africa can claim high impact world firsts such as reverse osmosis membrane technology, dry cooling demonstrated at scale in electricity generation, and more recently, some of the world's best 'new toilet' candidates. We are, at the same time, candid that we have to go up a gear in water and sanitation innovation, and this is an important component of the Water Research Commission's new Corporate Strategy.

The third characteristic is water business leadership. South Africa has a very developed water utility sector in the form of water boards as well as local authorities that are successful as water authorities. One of these, the very City of eThekweni that hosted World Water Day, was the recipient of the Stockholm Water Industry Award in 2014. There is, however, a conspicuous absence of a significant South African water private sector of international note. The result is that we have the double challenge of not only the lost opportunities of a growing international market for water and sanitation goods and services, but experience the disadvantage of being a net importer of these solutions and subject to the challenges of currency fluctuations and other risks associated with a negative water goods and services trade balance.



WRC CEO, Dhesigen Naidoo

There are, however, some positive notes in this direction. The WRC's business development initiatives are showing early successes in its innovation, water technologies demonstration programme and technology assessment portfolios. In May, Minister Rob Davis launched the latest IPAP (Industrial policy action plan) which, for the first time, includes a chapter on water as a national priority for industrial development, in its own right.

The summary is that South Africa is already a very prominent player in the international water and sanitation domain, and has the building blocks to in the next five years become an undisputed global water capital. Its rate of success will depend on what you and I as players in the South African water sector do to demonstrate our readiness for water and sanitation global leadership. This means in practice the following – growing the

water business in South Africa, building at scale our human capital, pushing further to be on the cutting edge of the development of technologies and solutions, and, becoming global leaders in water wise behaviours.



*The world's population is becoming increasingly urbanised. An additional 2.3 billion people are expected to live in cities by 2030.*



## Water Diary

### Water history

**June 15-17**

The conference of the International Water History Association will be held in Grand Rapids, Michigan, USA. The conference is co-hosted by Western Michigan University.

Visit: [www.iwha.net](http://www.iwha.net)

### Aquatic science

**June 26-29**

The annual conference of the Southern African Society of Aquatic Scientists will take place at the Birchwood Hotel and OR Tambo Conference Centre. This year's conference is hosted by the University of Johannesburg. Visit: <http://www.riv.co.za/sasaqs/nextcongresses.html>

### Geomorphology

**July 25-28**

The biennial conference of the South African Association of Geomorphology will be held at the University of Swaziland with the title 'Southern African Geomorphology: Pure and Applied'. A

number of themes have been identified for papers, including soil erosion and rehabilitation in theory and practice; bio-geomorphology; fluvial geomorphology, the geomorphology of wetland systems, and coasts and coastal stability, among others. Visit: <http://saag2017conference.com/>

### Catchment management

**October 9-11**

The International Water Association in association with Water Institute of Southern Africa (WISA) is hosting a specialist conference on watershed and river basin management at Skukuza camp, Kruger National Park.

Visit: [www.rbm2017.com](http://www.rbm2017.com)

### Groundwater

**October 14-18**

The Groundwater Division of the Geological Society of South Africa will be hosting its Biennial Conference at Spier Hotel, outside Stellenbosch with the theme 'Change, challenge, opportunity'.

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### International water

**November 13-14**

The International Water Association Development Congress & Exhibition will be held in Buenos Aires, Argentina. Visit: <http://www.iwa-network.org/news/save-the-date-iwa-water-and-development-congress-exhibition-2017/> for more information.

### Service delivery

**November 26-29**

The Water Research Commission, together with the WISA is hosting the Second International Peri Urban conference, to be held at the Century City Conference Centre, in Cape Town. The theme of this conference is 'Shaping development and sustainability in peri-urban environments'. Visit: [www.wisa.org.za](http://www.wisa.org.za)



## News

### UP appoints new Dean in Faculty of Health Sciences

The University of Pretoria (UP) has appointed Prof Tiaan de Jager as Dean of the Faculty of Health Sciences.

Before the appointment Prof De Jager held the position of Deputy Dean: Research and Postgraduate Studies, Professor: Environmental Health in the School of Health Systems and Public Health, and Director of the UP Institute for Sustainable Malaria Control. He is also an Extraordinary Lecturer in Andrology in

the School of Medicine's Department of Urology.

Prof De Jager completed a Masters degree in zoology at the University of the Free State before obtaining a PhD in Reproductive Biology: Urology at UP. He also completed a post-doctoral fellowship at the Université Laval in Quebec, Canada, a research skills for health professionals programme at the University of Oxford and a reproductive toxicology programme

in environmental health and safety at the University of Surrey, UK.

Prof De Jager has a C1 rating from the National Research Foundation and has obtained international recognition for his work. He is currently involved in various research projects, including ones focusing on malaria, reproductive toxicology and environmental health.

### South Africa's first biological invasions status report underway

The South African National Biodiversity Institute (SANBI) has launched a process to develop the first national status report on biological invasions in South Africa.

The report is due for completion in October.

'Biological invasions' refers to the process whereby organisms are transported by humans (either accidental or intentionally) to areas where they are not naturally present, and that on reaching such areas the organisms survive, breed and spread with the potential to cause a wide variety of significant negative environmental and socio-economic impacts.

The status report intends to inform the development and ongoing adaptation of appropriate policies to reduce the negative impacts of invasive alien species on natural ecosystems, the economy and the society.

Many alien species are beneficial; almost all agriculture and forestry in South Africa is dependent on organisms deliberately introduced by humans (including wheat,

maize, sheep and eucalypts). Preserving the benefits from these introduced species while limiting potential negative impacts from invasions that might result as a consequence, is a major challenge.

However, the purpose of the status report is to address the status of the relatively small number of species that have become problematic and are listed as invasive, including those that have been listed as prohibited. The report will be structured around four aspects. Firstly looking at pathways of introduction and spread; then looking at the status,

distribution, and impacts of individual alien species; thirdly, the degree to which areas are invaded and impacted upon by alien species; and finally, the effectiveness of interventions.

Dr Sebataolo Rahlao, Director: Biodiversity Pressures and Responses, leads the SANBI team, which has partnered with the Department of Science and Technology-National Research Foundation Centre of Excellence for Invasion Biology at Stellenbosch University to compile the report. Relevant experts have also been engaged.



## Another El Niño 'likely' to hit South Africa

South Africa could be hit by another El Niño during the next summer season, with concomitant dry weather and likelihood of drought.

This is according to South African Weather Service's (SAWS's) Chief Forecaster, Dr Eugene Poolman. He was speaking at the March meeting of the National Disaster Management Advisory Forum. Present at the gathering were representatives from national government departments, provincial disaster management heads and other stakeholders, including Eskom and the South African Bureau of Standards.

Dr Poolman said that although most parts of South Africa recently experienced above normal rainfall, SAWS's forecasting

showed the likelihood of the El Niño Southern Oscillation making a comeback in a few months. "Forecasting systems currently indicate an increased likelihood of an El Niño phase to develop towards the spring season. The likelihood has increased from previous assessments and as we near the winter period, these forecasts improve in reliability."

Dr Poolman noted that it was too early to predict the impact of the phenomenon on the next summer season over southern Africa, but added that SAWS would continue to monitor the development of these conditions and provide regular updates.

The Head of the National Disaster Management Centre, Dr Maphaka Tau,

said: "We are not out of the woods yet. It is absolutely necessary that we continue applying risk reduction, mitigation planning and water conservation interventions." Dr Tau implored provincial disaster management heads who were present to commit to a vigorous approach to disaster risk reduction planning that puts communities at its centre. "We need to translate our plans into meaningful interventions that have a lasting impact on the people of South Africa. It is important that we take our work seriously, remain accountable and put people first."

The gathering was also updated on the coordination of recent drought mitigation plans led by the Department of Cooperative Governance.

## New partnerships for capacity building

Annually supporting an average of 400 students, the WRC is a key player in not only supporting the development of new knowledge but also the advanced skills required to develop these solutions. In turn, the Energy and Water Sector Education Training Authority (EWSETA) has a pivotal role to play in orienting its 353 water sector levy payers towards emerging water solutions and innovations and driving investments in skills and training. To streamline the water sector skills pipeline

and prepare water sector employees for the water jobs and opportunities of the future, the WRC and EWSETA signed a collaborative agreement on 15 March 2017. This collaboration focuses on exploring how to unlock opportunities for exposure to emerging water solutions and innovations using existing bursary, learnership and internship processes. Also, using mechanisms such as the Water Technologies Demonstration Programme the partnership hopes to unlock opportunities to expose new water sector

entrants to technology demonstrations and management processes. This partnership also allows for the co-creation of new and more relevant mechanisms that will accelerate and streamline the water skills pipeline.



## Tripartite MOU set to benefit drought-stricken Namibia

The departments of water and sanitation (DWS), international relations and cooperation (DIRCO) and Rand Water signed a memorandum of understanding (MOU) with the Namibian government to provide much-needed relief to drought-stricken Namibia.

The MOU, which was signed on 6 April in Pretoria, is the upshot of President Jacob Zuma's announcement in 2013 to provide a cash injection of R50 million to Namibia to cushion the impact of drought. The

funds will be disbursed through DIRCO's financing vehicle, the African Renaissance Fund and will be used to drill boreholes. The relief effort will benefit the regions of Ohangwena, Zambezi, Kavango, Omaheke and Kunene. Rand Water has been appointed the implementing agent for the project.

Speaking at the signing ceremony, DWS Director-General, Dan Mashitsho, said the signing of the agreement would give further impetus to the cementing of

South Africa-Namibia water cooperation relations, emphasising that this was against the background of the drought that was still present in both countries. "The technical cooperation support by South Africa to Namibia on drought relief bears testimony to the political commitment demonstrated by our Heads of State in contributing to the water and sanitation agenda of Africa where African countries committed themselves to increasing their water mix, including around issues of groundwater."



## Monitoring corruption to achieve the SDGs



Transparency International has published a resource guide on Monitoring Corruption and Anti-corruption in the Sustainable Development Goals (SDGs). The publication stresses the important role of civil society organisations in monitoring corruption. It also points to major limitations in how the official SDG monitoring mechanisms take into account corruption and advocates mainstreaming reporting on corruption across the SDGs.

Corruption is a factor limiting development processes and directly affecting how and if all the SDGs can be achieved. It must, therefore, be taken into account across the board. To that end, the report provides guidelines to help identify potential indicators and data sources. Sample indicators are also provided for monitoring corruption for five key SDGs.

To access the publication, Visit: [www.transparency.org](http://www.transparency.org)

## Governments not keeping pace with growing demand for higher education

A new policy paper from the Global Education Monitoring (GEM) Report and the International Institute for Educational Planning at UNESCO shows that the number of university level students doubled to 207 between 2000 and 2014.

Governments are struggling to keep pace, with rapidly rising demand and large disparities in access, with a large cost of higher education often falling to families, many of whom cannot afford it.

The new paper, *Six ways to ensure higher education leaves no one behind*, sets out a series of measures to make higher education more equitable and affordable, including to ensure that student loan repayments do not exceed 15% of a student's monthly income.

"By creating and transmitting vital knowledge, skills and core values, higher education is a cornerstone for achieving the Sustainable Development Goals," said Irina Bokova, Director-General of UNESCO. "Demand for higher education is going to continue rising. Governments must

respond by introducing a range of new policies that will ensure expansion doesn't leave the marginalised behind, and that access is based on merit, not privilege."

Analysing global trends, the paper also shows that only 1% of the poorest students have spent more than four years in higher education, compared to 20% of the richest.

In South Africa, around one-sixth of African and coloured students attended higher education in 2013, compared to over 50% of white students. In Mexico, less than 1% of the indigenous population attended higher education. In China, youth from rural areas are seven times less likely to attend university than students from urban areas.

UNESCO advises governments to use a combination of policies aimed at helping the disadvantaged, such as low tuition fees, need-based scholarships and loans repayments adjusted according to income, to help families manage the costs. The paper draws on a range of

examples to show how different countries are expanding and diversifying higher education offerings to achieve greater equity.

"The last thing we want is for higher education to be the ball and chain around students' ankles," said Aaron Benavot, Director of the GEM Report. "Coping with dramatic student expansion is not easy, but there are policy solutions governments can put in place to stop the bill falling to households."

To access the policy paper, Visit: <http://bitly.com/tertiaryed>



## Tracking water productivity via satellite

Measuring how efficiently water is used in agriculture, particularly in water-scarce countries, is going high-tech with the help of a new tool developed by the Food and Agriculture Organisation of the United Nations (FAO).

The WaPOR open-access database has gone live, tapping satellite data to help farmers achieve more reliable agriculture yields and allowing for the optimisation of irrigation systems. The database allows for fine-grained analysis of water utilised through farming systems, generating empirical evidence about how it can be most productively used.

Worldwide water utilisation – the majority of which is used by agriculture – has outpaced the rate of population growth for most of the last century and some regions are close to breaching viable limits. “Water continues to surge at the same time that climate change – with increasing droughts and extreme weather – is altering and reducing water availability for agriculture,” noted FAO Deputy Director-General, Climate Change and Natural Resources, Maria Helena Semedo. “That puts a premium on making every drop count, underscoring the importance of meeting growing food

production needs from efficiency gains.”

WaPOR sifts through satellite data and uses Google Earth computing power to produce maps that show how much biomass and yield is produced per cubic meter of water consumed. The maps can be rendered at resolutions of as little as 30 to 250 m, and updated every one to ten days.

FAO’s team of information technology and land and water officers has designed the system – through a US\$10-million project funded by the Government of the

Netherlands – to cover Africa and the Near East, with a focus on key countries that are or are projected soon to face physical or infrastructural water scarcity.

Country level data was to be made available by June for Benin, Burundi, Egypt, Ethiopia, Ghana, Jordan, Kenya, Lebanon, Mali, Morocco, Mozambique, Rwanda, South Sudan, Syria, Tunisia, Uganda, West Bank and Gaza strip, and Yemen. Even more detailed data will come online in October, starting with pilot areas in Lebanon, Ethiopia and Mali.



## International report stresses need for increased efficiency to meet SDGs

Countries are not increasing spending fast enough to meet the water and sanitation targets under the Sustainable Development Goals (SDGs). This is according to a report published by the World Health Organisation (WHO) on behalf of UN Water – the United Nations inter-agency coordination mechanisms for all freshwater-related issues.

“Today, almost two billion people use a source of drinking water contaminated with faeces, putting them at risk of contracting cholera, dysentery, typhoid and polio,” noted Dr Maria Neira, WHO Director. “Contaminated drinking water is estimated to cause more than 500 000 diarrhoeal deaths each year, and is a major factor in several neglected

tropical diseases, including intestinal worms, schistosomiasis and trachoma.”

The report stresses that countries will not meet global aspirations of universal access to safe drinking water and sanitation unless steps are taken to use financial resources more efficiently and increase efforts to identify new sources of funding.

According to the UN Water Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS) 2017 report, countries have increased their budgets for water, sanitation and hygiene at an average rate of 4.9% over the last three years. Yet 80% of countries report that water, sanitation and hygiene financing is still insufficient to meet nationally-defined

targets for water, sanitation, and hygiene services.

In order to meet the SDG targets, the World Bank estimates investments in infrastructure need to triple to US\$114 billion per year – a figure which does not include operating and maintenance costs. “This is a challenge we have the ability to solve,” noted Guy Ryder, Chair of UN Water. “Increased investments in water and sanitation can yield substantial benefits for human health and development, generate employment and make sure that we leave no one behind.”

To access the GLAAS 2017 report, Visit: <http://bit.ly/2cLHjzg>

# Opinion

## Cape Town – lessons from the drought

*By the end of April, the levels of Cape Town's dams were hovering at only 23%, and Capetonians were watching the skies closely for the onset of winter rains. According to Dr Kevin Winter of the University of Cape Town's Future Water Institute the current drought being experienced in the Western Cape region has a number of lessons to offer. He offers up some solutions that must be put in place if we are to avoid this same scenario in the coming years.*



Water consumers in Cape Town rely almost entirely on stored surface water for drinking and every other purpose. There are not many countries that are capable of achieving water quality to potable standards.

The population of Cape Town has increased from 3.9 million (1996 census) to an estimated 6.4 million, which is an increase of 58%. But during this time, the stored water capacity has increased by only 14%. In addition, the long hot dry summers from 2015 to the present, and the below average rainfall for the region, has reduced the viable water reserve to the current position of approximately 18% [by March 2017]. The taps could run dry.

### The lessons

What have we learnt from this crisis so far? To date, there are three important lessons:

1. Water consumers are capable of using less water. Over the last 12 months, consumers have achieved the 30% reduction as required by Level 3 water restrictions – a reduction from 1.1 billion litres per day to 750 litres per day.
2. Rainfall variability over the Western Cape is taking water resource management into uncharted territory: climate uncertainty, increasing population, urbanisation and water demand. Government will need to react much faster with the implementation of restrictions, and have the capacity to keep these in place, to ensure that the main dams are at least 80% full by the end of October each year.
3. This present crisis is an opportunity to fast track initiatives that will make Cape Town a more water-sensitive, climate-resilient city. The lesson is that we have to be quicker and smarter in adapting to water scarcity.

The City of Cape Town reacted slowly to the decline in water

storage levels, which became evident towards the end of October 2016. Although Level 1 restrictions were already in place, Level 2 restrictions were only introduced in January, and it took a further six weeks before the effect of these restrictions were observed. The lag in this adjustment could be crucial. Level 3B restrictions were issued on 1 March, placing a further curb on water use for irrigating gardens, sports fields and constraining business activities that are highly reliant on water.

The City has struggled to bring the overall consumption to the level of 800 million litres per day and more recently to achieve a new target of less than 700 million litres per day for the city as a whole. The new target could be out of reach. Meanwhile, thousands of residents are engaged in social media, where advice and shared experiences are raising general awareness. There is lots of evidence showing how citizens are adapting to water scarcity, for example, by installing home-made greywater and water-harvesting systems.

The City is set to continue its strategy to restrict water demand – and rightly so considering the immediate crisis. It will be a tragedy for a city of over six million people to be without water. It is likely that the tragedy will be averted for now, but it could be a close call because weather patterns are increasingly uncertain. And there are expectations of another below-average rainfall season ahead.

#### Future water

By 2021 the City, in conjunction with the Department of Water

and Sanitation, will introduce new schemes to exploit water from sources that include a small-scale desalination plant; water from the Table Mountain aquifer; pumping excess water from the Berg River Dam to the Voëlvlei Dam; and improving the yield from treated water. However, these medium- to long-term schemes will not help the immediate crisis.

This is the opportunity to take a bold new lead by investing in measures that will build a climate-proof, water-sensitive city. A multi-pronged approach is required to manage existing supplies efficiently and to access new water sources, including treated water, stormwater and the sustainable abstraction of groundwater.

The future city of Cape Town will demonstrate how it values water as a critical resource that sustains human life adequately, provide dignity for all, and showcases the role of water in supporting the environment.

The current crisis represents a critical moment for fast-tracking integrated, innovative, water cost-effective solutions that can be introduced over the next 12 months. It needs to start now as a catalyst for investing in medium- to long-term technologies, tools and techniques to ensure that the city never has to face the risk of running out of water. This is an imperative, not an option.



The poster features a blue and white abstract water splash background. At the top, the text 'WRC SYMPOSIUM' is written in large, bold, white capital letters. Below this, the phrase 'Save THE Date' is written in a blue, cursive script. To the right of this, the dates 'SEPTEMBER 18 - 20 2017' are displayed in a clean, sans-serif font. Further right, the logo for 'JHB SOUTH - AFRICA' is shown. On the far right, there is a graphic of a white water droplet above the text 'WATER RESEARCH COMMISSION'.